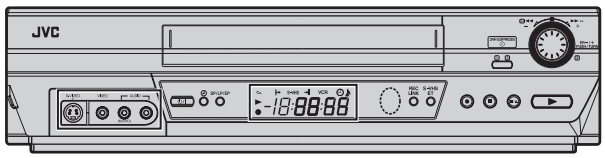
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-S6970AA,HR-S6970AG, HR-S6970AH,HR-S6970AJ



HR-S6970AA,HR-S6970AG,HR-S6970AH,HR-S6970AJ [V17S1]

G-CODE®
(AA,AH mode)

G-CODE™ / SHOWVIEW™
(AG,AJ mode)

S-VHS 525/625

Hi-Fi

Super VHS ET

For disassembling and assembling of MECHANISM ASSEMBLY, refer to the SERVICE MANUAL No.86700(MECHANISM ASSEMBLY).

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No.YD047
2004/12

SPECIFICATION

	HR-S6970AA	HR-S6970AH	HR-S6970AG	HR-S6970AJ
GENERAL				
Power requirement				
Rating	AC 110 V - 240 V, 50 Hz/60 Hz			
Operating	AC 90 V - 260 V, 50 Hz/60 Hz			
Power consumption				
Power on	18 W	20 W	18 W	20 W
Power off	3.5 W			
Temperature				
Operating	5°C to 40°C			
Storage	-20°C to 60°C			
Operating position	Horizontal only			
Dimensions (W×H×D)	400 mm × 94 mm × 275 mm			
Weight	3.1 kg			
Format	S-VHS/VHS standard			
Maximum recording time				
(SP)	240 min. with E-240 video cassette(PAL/MESECAM) 160 min. with T-160 video cassette(NTSC)			
(LP)	480 min. with E-240 video cassette(PAL/MESECAM)			
(EP)	720 min. with E-240 video cassette(PAL/MESECAM) 480 min. with T-160 video cassette(NTSC)			
VIDEO/AUDIO				
Signal system	PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields NTSC colour and EIA monochrome signals, 525 lines/60 fields			
Recording system	DA4 (Double Azimuth) head helical scan system			
Signal-to-noise ratio	45 dB			
Horizontal resolution				
S-VHS	400 lines			
VHS PAL/MESECAM	250 lines			
VHS NTSC	220 lines			
Frequency range				
Normal audio	70 Hz to 10,000 Hz			
Hi-Fi audio	20 Hz to 20,000 Hz			
Input/Output	RCA connectors: (IN × 2, OUT × 1), S-Video connectors: (IN × 2, OUT × 1)			
TUNER/TIMER				
TV channel storage capacity	99 positions (+AUX position)			
Tuning system	Frequency synthesized tuner			
Channel coverage	VHF : (Low) 42 MHz - 175MHz, (High) 175 MHz - 470 MHz UHF : 470 MHz - 870 MHz			
Aerial output	UHF channels (Adjustable E28- E60)			
Memory backup time	Approx. 10 minutes			
ACCESSORIES				
Provided accessories	RF cable, S-Video cable, Infrared remote control unit, "R6/UM-3" battery × 2		RF cable, S-Video cable, Infrared remote control unit, "R6/UM-3" battery × 2, Conversion plug* * Not provided in certain areas.	

Specifications shown are for SP mode unless otherwise specified.
E.& O.E. Design and specifications subject to change without notice.

SECTION 1
PRECAUTION

1.1 SAFTY PRECAUTIONS

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold.However,in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

1.1.1 Precautions during Servicing

(1) Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product.When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

(2) Parts identified by the ⚠symbol and shaded ( ) parts are critical for safety.
Replace only with specified part numbers.

NOTE :

Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

(3) Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

(4) Use specified internal wiring. Note especially:
- Wires covered with PVC tubing
- Double insulated wires
- High voltage leads

(5) Use specified insulating materials for hazardous live parts. Note especially:
- Insulation Tape
- PVC tubing
- Spacers
- Insulation sheets for transistors
- Barrier

(6) When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

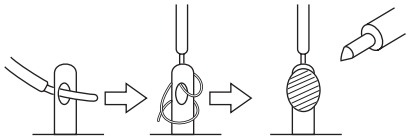


Fig.1-1-1

(7) Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

(8) Check that replaced wires do not contact sharp edged or pointed parts.

(9) When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

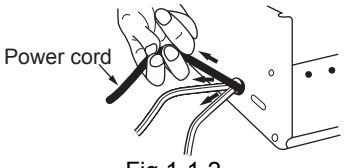


Fig.1-1-2

(10) Also check areas surrounding repaired locations.

(11) Products using cathode ray tubes (CRTs)In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits.Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

(12) Crimp type wire connectorIn such cases as when replacing the power transformer in sets where the connections between the power cord and power trans former primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
- **Connector part number** :E03830-001
- **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
- **Replacement procedure**

a) Remove the old connector by cutting the wires at a point close to the connector.Important : Do not reuse a connector (discard it).

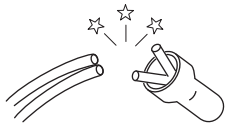


Fig.1-1-3

b) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

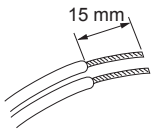


Fig.1-1-4

c) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

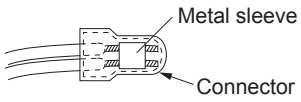


Fig.1-1-5

d) As shown in Fig.1-1-6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

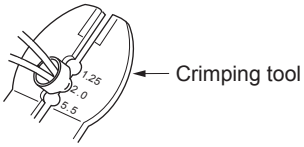


Fig.1-1-6

e) Check the four points noted in Fig.1-1-7.

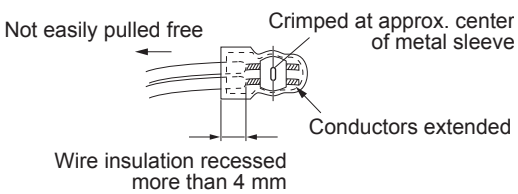

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.1-1-7

1.1.2 Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

(1) Insulation resistance test
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).See table 1 below.

(2) Dielectric strength test
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See Fig.1-1-11 below.

(3) Clearance distance
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See Fig.1-1-11 below.

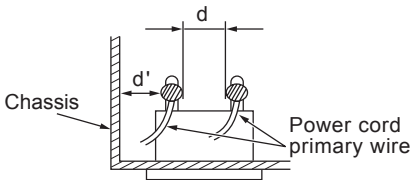


Fig.1-1-8

(4) Leakage current test
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
Measuring Method : (Power ON)Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See Fig.1-1-9 and following Fig.1-1-12.

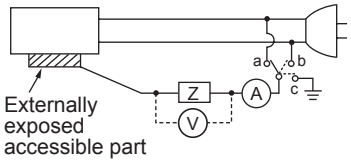
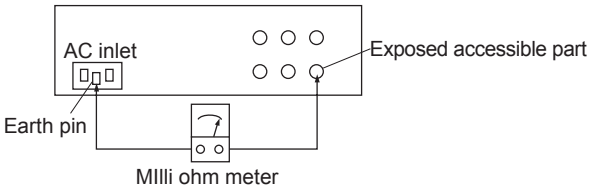


Fig.1-1-9

(5) Grounding (Class 1 model only)
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).Measuring Method:
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See Fig.1-1-10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

Fig.1-1-10

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦R≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Fig.1-1-11

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Fig.1-1-12

NOTE :
These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 2
SPECIFIC SERVICE INSTRUCTIONS

2.1 Different table of features

The following table indicates main different points between models HR-S6970AA,HR-S6970AG,HR-S6970AH and HR-S6970AJ.

	HR-S6970AA	HR-S6970AG	HR-S6970AH	HR-S6970AJ
POWER PLUG	AS/NZS	CEE	HK3PIN	SASO
CONVERSION PLUG	NOT USED	<--	<--	PROVIDED
BROADCASTING STANDARD	B/G,D/K,I	<--	B/G,D/K,I,M	<--
RF OUT CH/RF OUT SYSTEM [INITIAL]	28-60[36]G[H]KI	28-60[36][G]HKI	28-60[36][G]HKMI	<--
VCR PLUS+	G-CODE	G-CODE/SHOWVIEW	G-CODE	G-CODE/SHOWVIEW
OSD LANGUAGES	ENGLISH	ENGLISH, CHINESE	<--	<--

NOTE:
Mark <-- is same as left.

2.2 Service position

This unit has been designed so that the Mechanism and Main board assemblies can be removed together from the chassis assembly. Before diagnosing or servicing the circuit boards, take out the major parts from the chassis assembly.

2.2.1 How to set the "Service position"

(1) Refer to the disassembly procedure and perform the disassembly of the major parts before removing the Mechanism assembly.
(2) Remove the screws that fix the Mechanism assembly to the Chassis assembly. If any other screws are used to fix the boards, remove them also.
(3) Remove the combined Mechanism and Main board assemblies.
(4) If any other major parts are used, remove them also.
(5) Connect the wires and connectors of the major parts that have been removed in steps (1) to (4). (Refer to Fig. 2-2a.)
(6) Place the combined Mechanism, Main board and other board assemblies upside down.
(7) Insert the power cord plug into the power outlet and then proceed with the diagnostics and servicing of the board assembly.

Notes:

- **Before inserting the power cord plug into the power outlet, make sure that none of the electrical parts are able to short-circuit between the workbench and the board assembly.**
- **For the disassembly procedure of the major parts and details of the precautions to be taken, see "3.1 Removing the major parts".**
- **If there are wire connections from the Main board and Mechanism assemblies to the other major parts, be sure to remove them (including wires connected to the major parts) first before performing step (2).**
- **When carrying out diagnosis and repair of the Main board assembly in the "Service position", be sure to ground both the Main board and Mechanism assemblies. If they are improperly grounded, there may be noise on the playback picture or FDP counter display may move even when the mechanism is kept in an inoperative status.**
- **In order to diagnose the playback or recording of the cassette tape, set the Mechanism assembly to the required mode before placing it upside down. If the mechanism mode is changed (including ejection) while it is in an upside down position the tape inside may be damaged.**
- **For some models, the mechanism and board assemblies are attached by connectors only. When carrying out a diagnosis or repair of the boards in the "Service position", make sure that the connectors are not disconnected.**

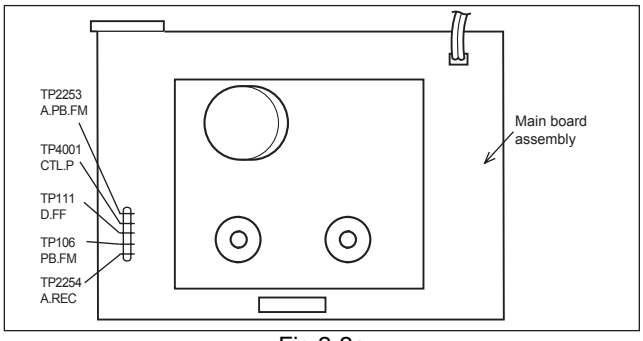


Fig.2-2a

2.3 Jig RCU mode

This unit uses the following two modes for receiving remote control codes.

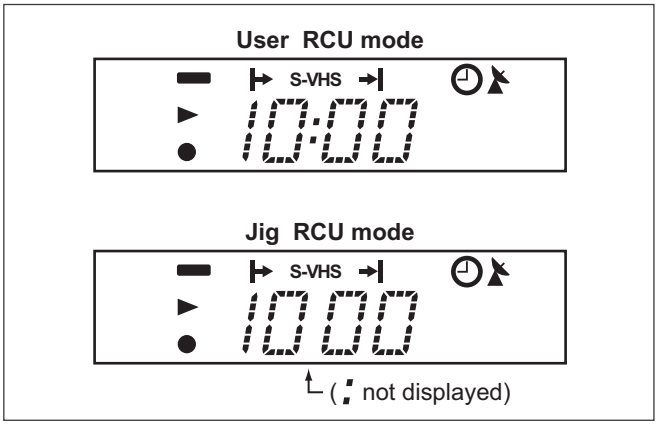
(1) User RCU mode:Ordinary mode for use by the user.

(2) Jig RCU mode: Mode for use in production and servicing.

When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). As both of the above two modes are stored in the EEPROM, it is required to set the VCR back to the User RCU mode each time that an adjustment is made or to check that the necessary operations have been completed.These modes can be set by the operations described below.

Note:

- **Confirm the RCU mode when exchanged parts. Since some SERVICE PARTS sets the VCR to the Jig RCU mode as initial setting. Therefore please set the VCR to the user RCU mode after replacing the EEPROM.**



2.3.1 Setting the Jig RCU mode

(1) Unplug the power cord plug from the power outlet.

(2) Press and hold the "REC" and "PAUSE" buttons on the VCR simultaneously, while plugging the power cord plug into the power outlet.
When the VCR is set to the Jig RCU mode, the symbols (" : ") in the time display of the FDP are turned off.

2.3.2 Setting the User RCU mode

(1) Turn off the power.

(2) Press the "REC" and "PAUSE" buttons of the VCR simultaneously. Alternatively, transmit the code "43-80" from the Jig RCU.

2.4 Mechanism service mode

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "Mechanism service mode".

2.4.1 How to set the "Mechanism service mode"

(1) Set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received).

(2) Transmit the code "43-E5" from the Jig RCU.

(3) Release the lug of the Cassette holder and then slide the Cassette holder toward the direction where the Cassette holder is loaded by manually.

(4) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.
When the VCR is set to the Mechanism service mode, the symbols ("Timer") in the FDP (LED) are blinked.

2.4.2 How to exit from the "Mechanism service mode"

(1) Unplug the power cord plug from the power outlet.

2.5 Maintenance and inspection

2.5.1 Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.
When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

Note:

- **Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.**

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.

(3) After cleaning, make sure that the cleaned parts are completely dry before using the cassette tape.

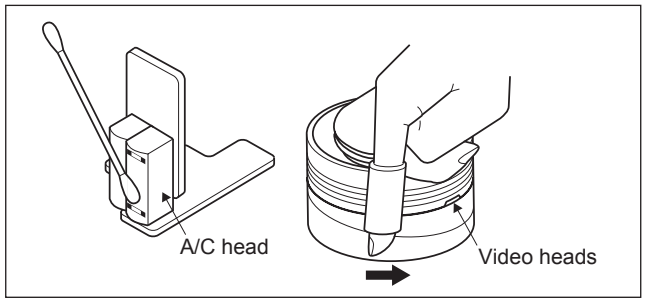


Fig.2-5a

2.5.2 Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

Note:

- **See the "mechanism assembly" diagram of the "parts list" for the lubricating or greasing spots, and for the types of oil or grease to be used.**

2.5.3 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time, even if the set is not used.

System	Parts name	Operation hours	
		1000H	2000H
Tape transport	Drum assembly	C,X	X
	A/C head	C,X	C,X
	Pinch roller arm assembly	C	C
	Full erase head	C	C
	Tension arm assembly	C	C
	Capstan motor (Shaft)	C	C
	Guide arm assembly	C	C
Drive	Capstan motor		X
	Capstan brake assembly		X
	Main brake assembly		X
	Belt (Capstan)	X	X
	Loading motor		X
	Clutch unit		X
	Worm gear		X
	Control plate		X
Other	Rotary encoder		X

C : Cleaning
X : Inspection or Replacement if necessary

SECTION 3
DISASSEMBLY

3.1 Removing the major parts

3.1.1 How to read the procedure table

This table shows the steps for disassembly of the externally furnished parts and board assemblies. Reverse these steps when re-assembling them.

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover	3-1a	4(S1a),(S1b),3(L1a), 2(SD1a),(P1a),(W1a), CN1(WR1a),	<Note 1a>
	Bracket		2(S1c)	

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order.
These numbers are also used as the identification (location) No. of parts Figures.

(2) Part name to be removed or installed.

(3) Fig. No. showing procedure or part location.

(4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered.
P= Spring, W= Washer, S= Screw, L= Locking tab, SD= Solder, CN**(WR**)= Remove the wire (WR**) from the connector (CN**).

Note:
- **The bracketed ( ) WR of the connector symbol are assigned nos. in priority order and do not correspond to those on the spare parts list.**

(5) Adjustment information for installation

3.1.2 Disassembly procedure

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover	3-1d	2(S1a), (S1b)	
[2]	Front panel assembly	3-1d 3-1a	2(S2a), 6(L2a), 3(L2b) CN7001(WR2a)	<Note 2a>
[3]	Mechanism assembly	3-1d	CN2001(WR3a), 2(S3a)	<Note 3a> <Note 3b>
	(Drum assembly)	3-1b 3-1c	CN1(WR3b), (S3c), (S3d), (S3e)	<Note 3c> <Note 3d>
	(Cleaner assembly)		2(L3a)	
	(Interia plate)		4(L3b)	
	(Roller arm assembly)		(L3c),(P3a)	
[4]	Main board assembly	3-1d	7(L4a)	

< Note 2a >
- When reattaching the Front panel assembly, make sure that the door opener of the Side frame (R) is lowered in position prior to the reinstallation.
- When reattaching the Front panel assembly, pay careful attention to the switch lever of the Front panel assembly not to make it touch the switch knob of the Main board assembly from the side.
- When reattaching the Front panel assembly, lift the Cassette door slightly.

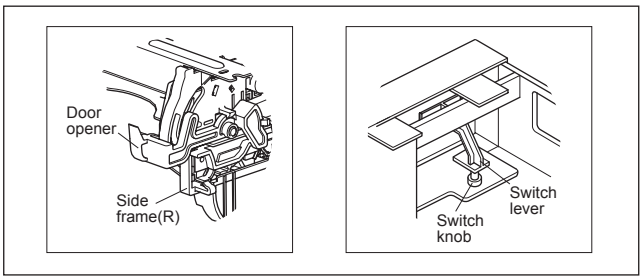


Fig.3-1a

< Note 3a >
- Be careful not to damage the connector and wire etc. during connection and disconnection.
- When connecting the flat wire to the connector, be careful with the flat wire direction.

< Note 3b >
- When reattaching the Mechanism assembly, secure the screws (S3a to S3b) in the order of a, b.

< Note 3c >
- When reattaching the Mechanism assembly, be sure to align the phase of the Rotary encoder on the Main board assembly.
- When reattaching the Mechanism assembly, set the "Mechanism assembling mode". [See "MECHANISM ASSEMBLY SERVICE MANUAL (No. 86700)".]
- When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors and switch on the Main board assembly.

< Note 3d >
- When reattaching the Drum assembly, secure the screws (S3c to S3e) in the order of c, d, e.

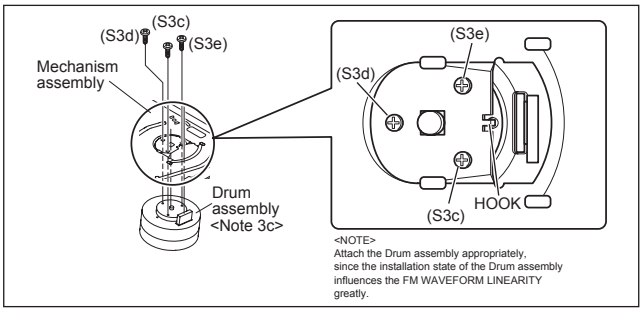


Fig.3-1b

- When handling the drum assembly alone, hold it by the motor or shaft. Be careful not to touch other parts, especially the video heads. Also take care not to damage the connectors.

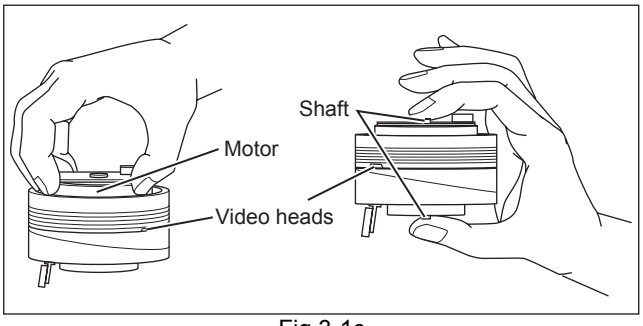


Fig.3-1c

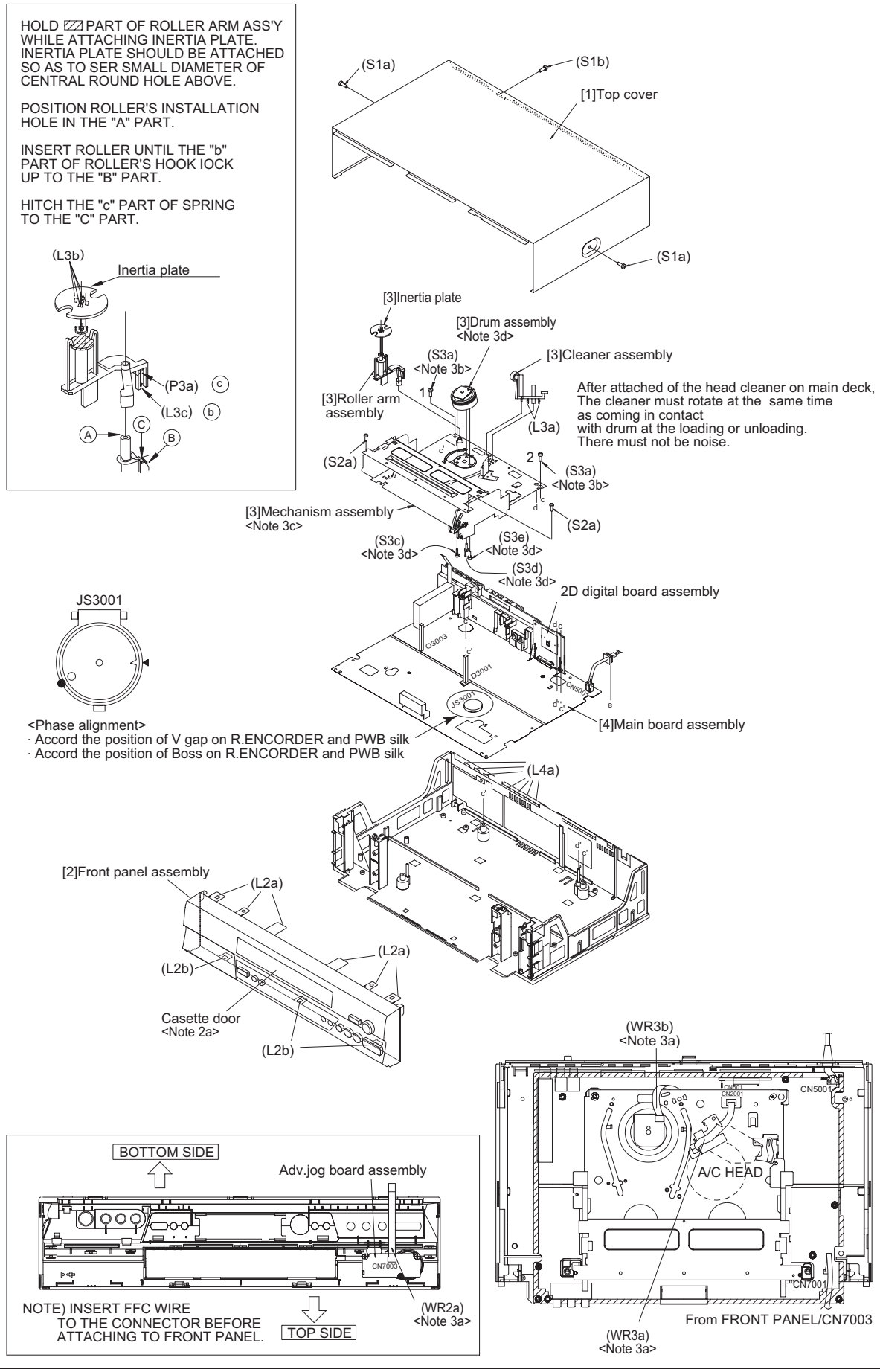

HOLD ▨ PART OF ROLLER ARM ASS'Y WHILE ATTACHING INERTIA PLATE. INERTIA PLATE SHOULD BE ATTACHED SO AS TO SER SMALL DIAMETER OF CENTRAL ROUND HOLE ABOVE.
POSITION ROLLER'S INSTALLATION HOLE IN THE "A" PART.
INSERT ROLLER UNTIL THE "b" PART OF ROLLER'S HOOK IOCK UP TO THE "B" PART.
HITCH THE "c" PART OF SPRING TO THE "C" PART.
(L3b)
Inertia plate
(P3a)
(L3c)
(S1a)
(S1b)
[1]Top cover
[3]Inertia plate
[3]Drum assembly <Note 3d>
(S3a) <Note 3b>
[3]Cleaner assembly
[3]Roller arm assembly
After attached of the head cleaner on main deck, The cleaner must rotate at the same time as coming in contact with drum at the loading or unloading. There must not be noise.
(L3a)
(S2a)
(S3a) <Note 3b>
[3]Mechanism assembly <Note 3c>
(S2a)
(S3c) <Note 3d>
(S3e) <Note 3d>
(S3d) <Note 3d>
2D digital board assembly
JS3001
<Phase alignment>
· Accord the position of V gap on R.ENCORDER and PWB silk
· Accord the position of Boss on R.ENCORDER and PWB silk
[4]Main board assembly
(L4a)
[2]Front panel assembly
(L2a)
(L2b)
Casette door <Note 2a>
(WR3b) <Note 3a>
A/C HEAD
CN5001
CN7001
From FRONT PANEL/CN7003
(WR3a) <Note 3a>
BOTTOM SIDE
Adv.jog board assembly
CN7003
NOTE) INSERT FFC WIRE TO THE CONNECTOR BEFORE ATTACHING TO FRONT PANEL.
TOP SIDE
(WR2a) <Note 3a>

Fig.3-1d

SECTION 4
ADJUSTMENT

4.1 Before adjustment

4.1.1 Precaution

- **The adjustments of this unit include the mechanism compatibility and electrical adjustments. During the performance of this work, be sure to observe the precautions for each type of adjustment.**
- **If there is a reference to a signal input method in the signal column of the adjustment chart, "Ext. S-input" means the Y/C separated video signal and "Ext. input" means the composite video signal input.**
- **Unless otherwise specified, all measuring points and adjustment parts are located on the Main board.**

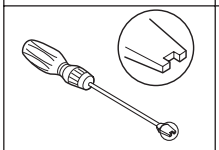
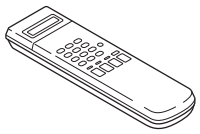
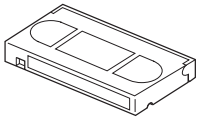
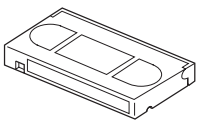
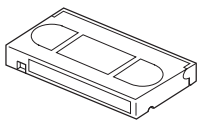
4.1.2 Required test equipments

- Color (colour) television or monitor
- Oscilloscope: wide-band, dual-trace, triggered delayed sweep
- Signal generator: RF / IF sweep / marker
- Signal generator: stairstep, color (colour) bar [NTSC]
- Recording tape
- Digit-key remote controller(provided)

4.1.3 Required adjustment tools

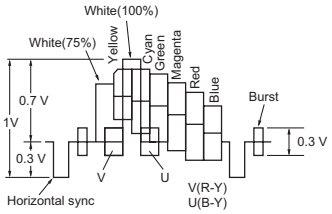
● : Used --- : Not used

	Mechanism compatibility adjustment	Electrical adjustment
Roller driver	●	---
Jig RCU	---	●
Back tension cassette gauge	●	---
Alignment tape(MHPE)	●	---
Alignment tape(MHPE-L)	●	●

Roller driver PTU94002	Jig RCU PTU94023B	Back tension cassette gauge PUJ48076-2
		
Alignment tape (SP, stairstep, PAL) MHPE	Alignment tape (LP, stairstep, PAL) MHPE-L	
		

4.1.4 Color (colour) bar signal,Color (colour) bar pattern

• Colour bar signal [PAL]



• Colour bar pattern [PAL]

4.1.5 Switch settings

When adjusting this unit, set the VCR mode and switches as described below.

- When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). (See "section 2 SPECIFIC SERVICE INSTRUCTIONS".)

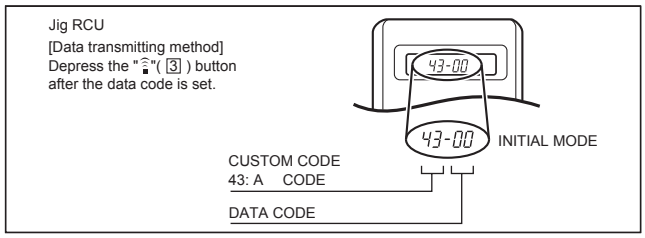


Fig.4-1a Jig RCU [PTU94023B]

- Set the switches as shown below unless otherwise specified on the relevant adjustment chart. The switches that are not listed below can be set as desired.
  If the VCR is not equipped with the functions detailed below, setup is not required.

AUTO PICTURE/VIDEO CALIBRATION/ B.E.S.T./D.S.P.C.	OFF
PICTURE CONTROL/SMART PICTURE	NORMAL/NATURAL
VIDEO STABILIZER	OFF
TBC	ON
Digital 3R	ON
VIDEO NAVIGATION/TAPE MANAGER	OFF
BLUE BACK	OFF

4.1.6 Manual tracking mode (Auto tracking ON/OFF) setting

(1) In order to set to the manual tracking mode during tape playback, press the “SP/EP(LP)”button on the remote control unit.
- Each press of the button switches the auto tracking ON or OFF.
- When the manual tracking mode is set, the tracking is placed at the center position.

(2) Press “channel +/-” to adjust the tracking manually.

4.1.7 EVR Adjustment

Some of the electrical adjustments require the adjustment performed by the EVR system. The main unit have EEPROMs for storing the EVR adjustment data and user setups.

Notes:

- **In the EVR adjustment mode, the value is varied with the channel buttons (+, -). The adjusted data is stored when the setting mode changes (from PB to STOP, when the tape speed is changed, etc.). Take care to identify the current mode of each adjustment item when making an adjustment.**
- **When changing the address setting in the EVR adjustment mode, use the Jig RCU or the remote controller having numeric keypad with which a numeric code can be directly input.**
  The remote control code of the Jig RCU corresponds to each of the digit keys on the remote controller as follows.

Digit-key	0	1	2	3	4	5	6	7	8	9
Code	20	21	22	23	24	25	26	27	28	29

- **As the counter indication and remaining tape indication are not displayed FDP during the EVR adjustment mode, check them on the TV monitor screen.**
- **When performing the EVR adjustment, confirm that the FDP indication is changed to the EVR mode, as shown below.**

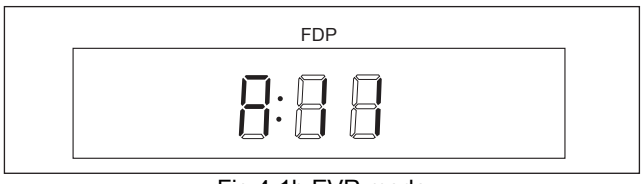


Fig.4-1b EVR mode

4.2 Mechanism compatibility adjustment

Notes:

- **Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the A/C head, drum assembly or any part of the tape transport system.**
- **To prevent damaging the alignment tape in the compatibility adjustment, prepare a cassette tape (for self-recording/playback), perform a test on it by transporting it and making sure that the tape is not bent by the tape transport mechanisms such as in the guide rollers.(See Fig.4-2b.)**

4.2.1 Tension pole position

Notes:

- **This adjustment must be performed every time the tension band is replaced.**

Signal	(A)	• Back tension cassette gauge [PUJ48076-2]
Mode	(B1) (B2)	• PB • Eject end
Adjustment part	(F)	• Adjust pin [Mechansim assembly]
Specified value	(G)	• 25 - 51 gf•cm (2.45 - 5 x 10^{-3} Nm)

(1) Play back the back tension cassette gauge (A).
(2) Check that the indicated value on the left side gauge is within the specified value (G).
(3) If the indicated value is not within the specified value (G), perform the adjustment in a following procedure.(See Fig.4-2a.)
   a) Remove the top frame, cassette holder and side frames (L/R) all together. (Refer to the SERVICE MANUAL No.86700 [MECHANISM ASSEMBLY].)
   b) Rotate the loading motor gear to move the control plate so that the triangular stamping to the left of the “P”stamping is aligned with the stamping (a) on the main deck. This positioning is mode (B1).
   c) Adjust by turning the adjustment pin so that the tip of the tension arm is aligned with the stamping (b) on the main deck.
   d) Rotate the reel disk (S) by about one turn clockwise and make sure that the round hole of the adjustment pin is located in the “OK” range. If it is outside this range, restart the adjustment from the beginning.

   After completion of the adjustment, rotate the loading gear motor to return it to the mode (B2) position.

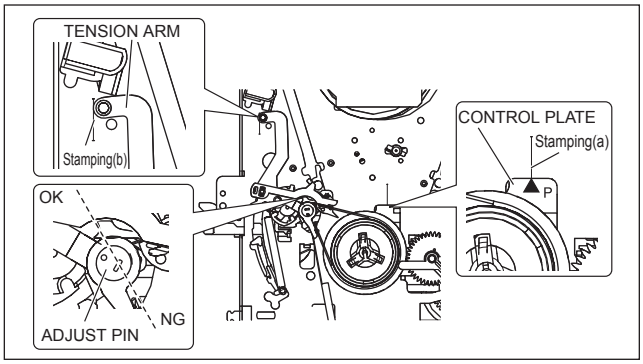


Fig.4-2a

4.2.2 FM waveform linearity

Signal	(A1) (A2)	• Alignment tape(SP, stairstep, PAL) [MHPE] • Alignment tape(LP,stairstep,PAL) [MHPE-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• Guide roller [Mechanism assembly]
Specified value	(G)	• Flat V.PB FM waveform
Adjustment tool	(H)	• Roller driver [PTU94002]

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Set the VCR to the manual tracking mode.
(4) Make sure that there is no significant level drop of the V.PB FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig. 4-2c.)
(5) Reduce the V.PB FM waveform by the tracking operation.
If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver to make the V.PB FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the roller driver to make it linear. (See Fig. 4-2c.)
(6) Make sure that the V.PB FM waveform varies in parallel and linearly with the tracking operation again. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
(7) Unload the cassette tape once, play back the alignment tape (A1) again and confirm the V.PB FM waveform.
(8) After adjustment, confirm that the tape wrinkling does not occur at the roller upper or lower limits. (See Fig. 4-2b.) [Perform adjustment step (9) only for the models equipped with SP mode and EP (or LP) mode.]

[Perform adjustment step (9) only for the models equipped with SP mode and EP (or LP) mode.]

(9) Repeat steps (1) to (8) by using the alignment tape (A2).

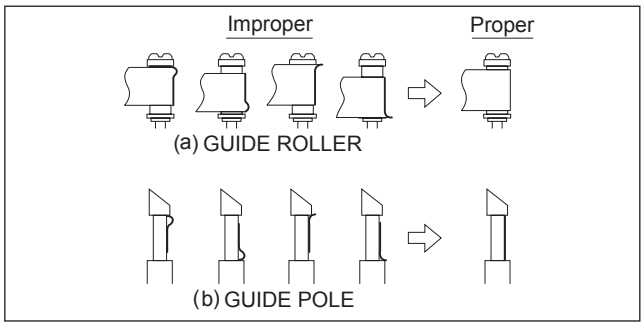


Fig.4-2b

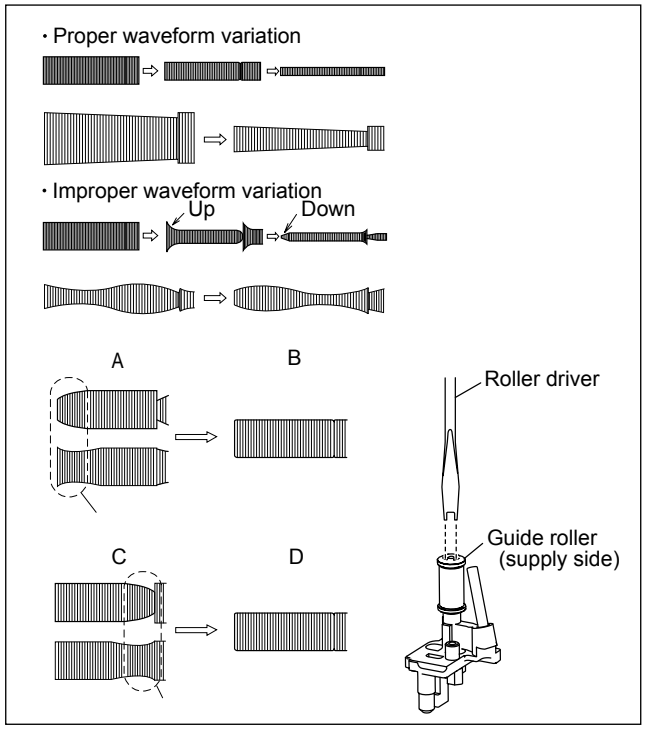


Fig.4-2c

4.2.3 Height and tilt of the A/C head

Note:

- **Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (Refer to the SERVICE MANUAL No.86700 [MECHANISM ASSEMBLY].)**

Signal	(A)	• Alignment tape(SP, stairstep, PAL) [MHPE]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D1) (D2)	• TP106 (PB. FM) • TP4001 (CTL. P)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• A/C head [Mechanism assembly]
Specified value	(G)	• Maximum waveform

(1) Play back the alignment tape (A).
(2) Apply the external trigger signal to D.FF (E), to observe the AUDIO OUT waveform and Control pulse waveform at the measuring points (D1) and (D2) in the ALT mode.
(3) Set the VCR to the manual tracking mode.
(4) Adjust the AUDIO OUT waveform and Control pulse waveform by turning the screws (1), (2) and (3) little by little until both waveforms reach maximum. The screw (1) and (3) are for adjustment of tilt and the screw (2) for azimuth.

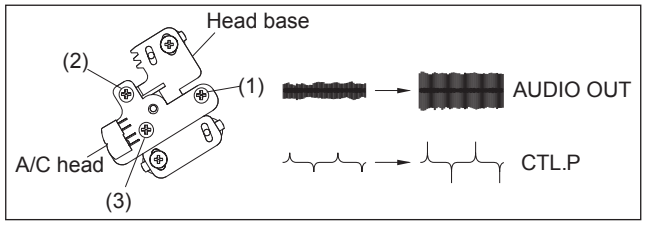


Fig.4-2d

4.2.4 A/C head phase (X-value)

Signal	(A1) (A2)	• Alignment tape(SP, stairstep, PAL) [MHPE] • Alignment tape(LP,stairstep,PAL) [MHPE-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• A/C head base [Mechanism assembly]
Specified value	(G)	• Flat V.PB FM waveform
Adjustment tool	(H)	• Roller driver [PTU94002]

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Set the VCR to the manual tracking mode.
(4) Loosen the screws (4) and (5), then set the Roller driver to the innermost projected part of the A/C head. (See Fig. 4-2e.)
(5) Rotate the roller driver so that the A/C head comes closest to the capstan. From there, move the A/C head back gradually toward the drum until the point where the FM waveform is maximized for the second time, and then tighten the screws (4) and (5) temporarily.
(6) Play an alignment tape (A2) and set to the manual-tracking mode.
(7) Fine-adjust A/C head base position to maximize the FM waveform, and then tighten the screws (4) and (5) firmly.
(8) Play alignment tapes (A1) and (A2) and confirm that the FM waveforms are maximized when the tracking is at the center position.

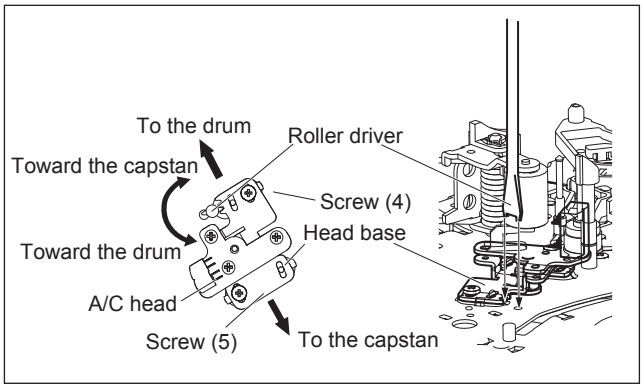


Fig.4-2e

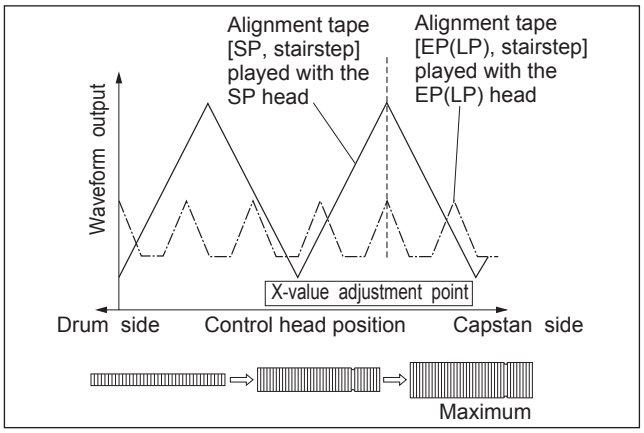


Fig.4-2f

4.3 Electrical adjustment

Note:
The following adjustment procedures are not only necessary after replacement of consumable mechanical parts or board assemblies, but are also provided as references to be referred to when servicing the electrical circuitry.
In case of trouble with the electrical circuitry, always begin a service by identifying the defective points by using the measuring instruments as described in the following electrical adjustment procedures. After this, proceed to the repair, replacement and/or adjustment. If the required measuring instruments are not available in the field, do not change the adjustment parts (variable resistor, etc.) carelessly.

4.3.1 Servo circuit

4.3.1.1 Switching point

Signal	(A1) (A2)	• Stairstep signal • Alignment tape(LP,stairstep,PAL) [MHPE-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• VIDEO OUT terminal (75 ohm terminated) • TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• Jig RCU: Code “43-5A”
Specified value	(G)	• 7.5 ± 0.5H
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Play back the signal (A1) of the alignment tape (A2).
(2) Apply the external trigger signal to D.FF (E) to observe the VIDEO OUT waveform and V.PB FM waveform at the measuring points (D1) and (D2).
(3) Set the VCR to the manual tracking mode.
(4) Adjust tracking so that the V.PB FM waveform becomes maximum.
(5) Set the VCR to the Auto adjust mode by transmitting the code (F) from the Jig RCU. When the VCR enters the stop mode, the adjustment is completed.
(6) If the VCR enters the eject mode, repeat steps (1) to (5) again.
(7) Play back the alignment tape (A2) again, confirm that the switching point is the specified value (G).

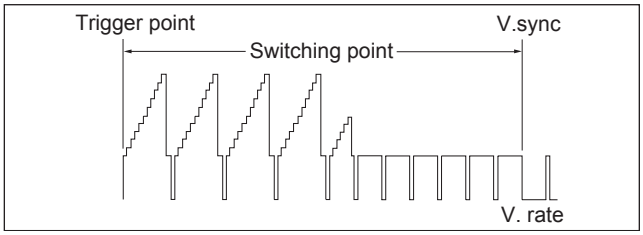


Fig.4-3a Switching point

4.3.1.2 Slow tracking preset

Signal	(A1) (A2) (A3)	• Ext. input • Color (colour) bar signal [PAL] • Color (colour) bar signal [NTSC]
Mode	(B1) (B2)	• VHS SP • VHS LP (or EP)
Measuring point	(D)	• TV-Monitor
Adjustment part	(F)	• Jig RCU: Code “43-71”or “43-72”
Specified value	(G)	• minimum noise
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Record the signal (A2) in the mode (B1), and play back the recorded signal.
(2) Set the VCR to the manual tracking mode.
(3) Set the VCR to the FWD slow (+1/6x) mode.

(4) Transmit the code (F) from the Jig RCU to adjust so that the noise bar becomes the specified value (G) on the TV monitor in the slow mode.
(5) Set the VCR to the Stop mode.
(6) Confirm that the noise bar is (G) on the TV monitor in the slow mode.
(7) Repeat steps (3) to (6) in the REV slow (+1/6x) mode.
(8) Repeat steps (1) to (7) in the mode (B2).
(9) Record the signal (A3) in the mode (B1), and play back the recorded signal.
(10) Repeat steps (2) to (8).

Note:

- **For FWD slow (+1/6x) playback, transmit the code "43-08" from the Jig RCU to enter the slow playback mode, and transmit the code "43-D0"for REV slow (-1/6x) mode.**

4.3.2 Video circuit

4.3.2.1 EE Y/PB Y level

Signal	(A1)	• Ext. S-input
	(A2)	• Ext. input
	(A3)	• Color (colour) bar signal [PAL]
	(A4)	• Color (colour) bar signal [NTSC]
Mode	(B1)	• EE SP
	(B2)	• S-VHS SP
	(B3)	• VHS SP
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• Y OUT terminal (75 ohm terminated)
EVR mode	(F1)	• Jig code "43-57"
EVR address	(F2)	• A : 11
	(F3)	• Jig code "43-21" twice
	(F4)	• Jig code "43-18" or 43-19" (Channel +/-)
Specified value	(G)	• 1.00 ± 0.05 Vp-p
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Input the signal (A3) from the input point (A1).
(2) Set the VCR to the mode (B1).
(3) Observe the Y OUT waveform at the measuring point (D).
(4) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU.
(5) Set the EVR address to (F2) by transmitting the code (F3) from the Jig RCU.
(6) Transmit the code (F4) from the Jig RCU to adjust so that the Y level of the Y OUT waveform becomes the specified value (G).
(7) Release the EVR mode of the VCR by transmitting the code (F1) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)
(8) Input the signal (A3) from the input point (A2).
(9) Repeat steps (3) to (7) in the mode (B1).
(10) Record the signal (A3) in the mode (B2), and play back the recorded signal.
(11) Set the VCR to the manual tracking mode.
(12) Repeat steps (3) to (7) in the mode (B2).
(13) Record the signal (A3) in the mode (B3), and play back the recorded signal.
(14) Set the VCR to the manual tracking mode.
(15) Repeat steps (3) to (7) in the mode (B3).
(16) Input the signal (A4) from the input point (A1).
(17) Repeat steps (2) to (15).

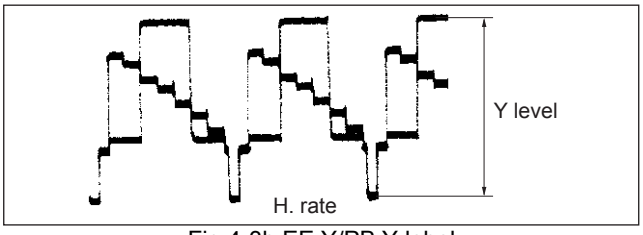


Fig.4-3b EE Y/PB Y lebel

4.3.3 Syscon circuit

Notes:

- **When perform this adjustment, remove the Mechanism assembly.**

4.3.3.1 Timer clock

Signal	(A1)	• No signal
Mode	(B)	• EE
Equipment	(C)	• Frequency counter
Measuring point	(D1)	• IC3001 pin 44
	(D2)	• IC3001 pin 103
	(D3)	• C3054 + and -
Adjustment part	(F)	• C3025 (TIMER CLOCK)
Specified value	(G)	• 1024.008 ± 0.001 Hz (976.5549 ± 0.0010 usec)

(1) Connect the frequency counter to the measuring point (D1).
(2) Connect the short wire between the short point (D2) and Vcc (5V).
(3) Short the leads of capacitor (D3) once in order to reset the microprocessor of the Syscon.
(4) Disconnect the short wire between the short point (D2) and Vcc then connect it again.
(5) Adjust the Adjustment part (F) so that the output frequency becomes the specified value (G).

SECTION 5
TROUBLESHOOTING

5.1 Manually removing the cassette tape

If you cannot remove the cassette tape which is loaded because of any electrical or mechanical failures, manually remove it by taking the following steps.

(1) Unplug the power cord plug from the power outlet.

(2) Refer to the disassembly procedure of the VCR and perform the disassembly of the major parts before removing the mechanism assembly. (See Fig. 5-1a)

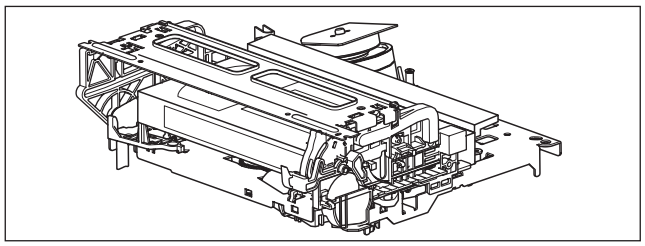


Fig.5-1a

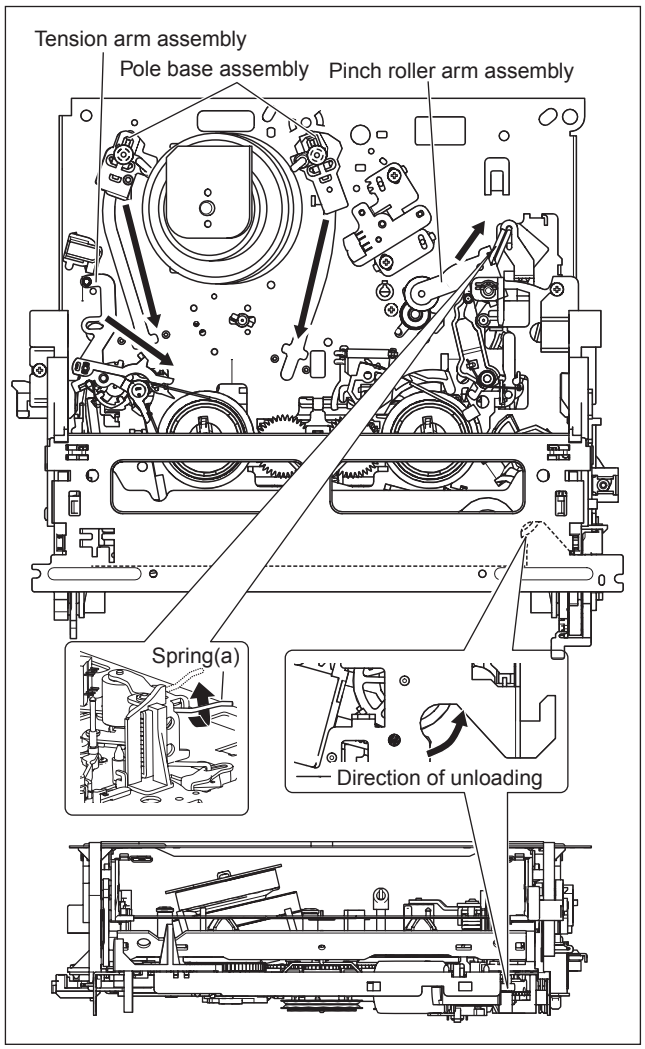


Fig.5-1b

(3) Unload the pole base assembly by manually turning the gear of the loading motor until the pole base assembly is hidden behind the cassette lid. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.5-1b)

In case of mechanical failures, while keeping the tension arm assembly free from tension, pull out the tape on the pole base assembly. Take the spring(a) of the pinch roller arm assembly off the hook, and detach it from the tape.

(4) Remove the screw (a) of the side frame (L/R).

(5) Hold the slack tape and cassette cover together, lift the cassette tape, top frame, cassette holder and side frames (L, R) together from the rear and remove them by dis-engaging the hooks (a) and (b).

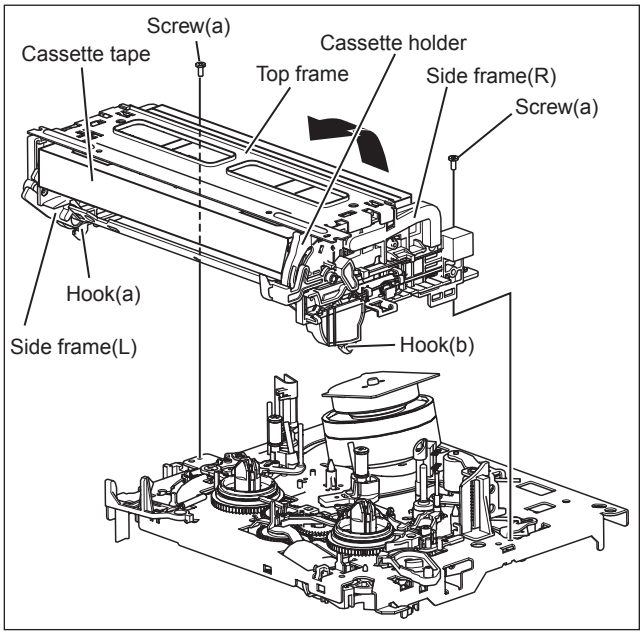


Fig.5-1c

(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

5.2 Emergency display function

This unit saves details of the last two emergencies as the EMG history and allows the status of the VCR and the mechanism of each emergency to be shown both on the display and as OSD information.
When using the emergency function, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received).

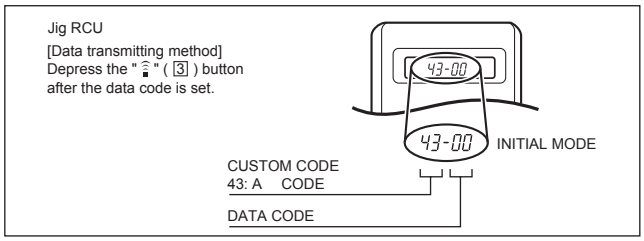


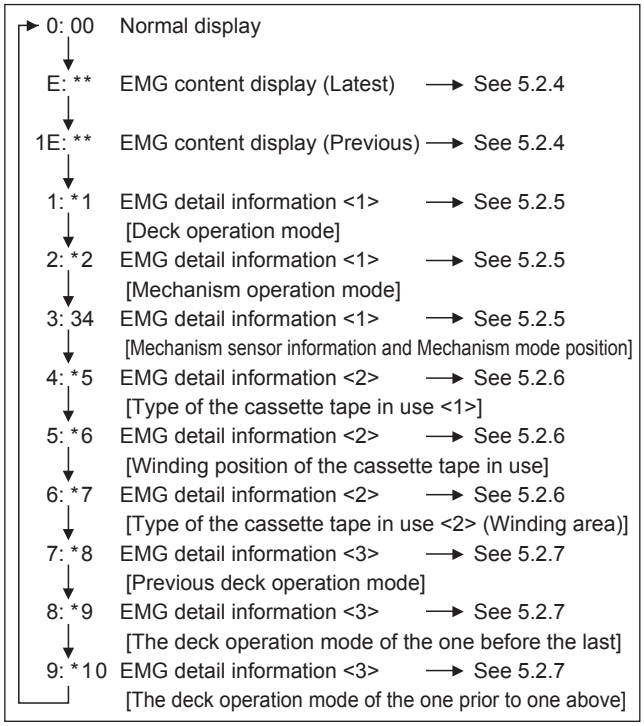
Fig.5-2a Jig RCU [PTU94023B]

5.2.1 Displaying the EMG information

The EMG detail of information can be displayed by transmitting the code "43-59" from the Jig RCU.

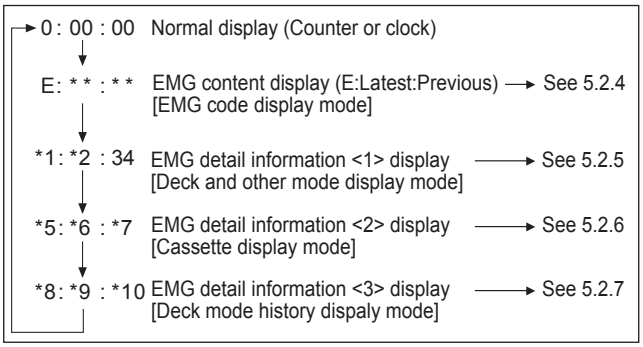
Note:

- **The EMG detail information < 1 >< 2 > show the information on the latest EMG.**
  It becomes " - - : - - : - -" when there is no latest EMG record.


0: 00 Normal display
E: ** EMG content display (Latest) → See 5.2.4
1E: ** EMG content display (Previous) → See 5.2.4
1: *1 EMG detail information <1> → See 5.2.5
[Deck operation mode]
2: *2 EMG detail information <1> → See 5.2.5
[Mechanism operation mode]
3: 34 EMG detail information <1> → See 5.2.5
[Mechanism sensor information and Mechanism mode position]
4: *5 EMG detail information <2> → See 5.2.6
[Type of the cassette tape in use <1>]
5: *6 EMG detail information <2> → See 5.2.6
[Winding position of the cassette tape in use]
6: *7 EMG detail information <2> → See 5.2.6
[Type of the cassette tape in use <2> (Winding area)]
7: *8 EMG detail information <3> → See 5.2.7
[Previous deck operation mode]
8: *9 EMG detail information <3> → See 5.2.7
[The deck operation mode of the one before the last]
9: *10 EMG detail information <3> → See 5.2.7
[The deck operation mode of the one prior to one above]

EMG display of 7segment LED display model

Fig.5-2b


0 : 00 : 00 Normal display (Counter or clock)
E: * * : * * EMG content display (E:Latest:Previous) → See 5.2.4
[EMG code display mode]
*1 : *2 : 34 EMG detail information <1> display → See 5.2.5
[Deck and other mode display mode]
*5 : *6 : *7 EMG detail information <2> display → See 5.2.6
[Cassette display mode]
*8 : *9 : *10 EMG detail information <3> display → See 5.2.7
[Deck mode history dispaly mode]

EMG display of FDP display model

Fig.5-2c

< Reference > EMG display of FDP display mode

(1) Transmit the code "43-59" from the Jig RCU.
The FDP shows the EMG content in the form of "E:**":.

<Example 1> E : 01 ← Latest EMG

<Example 2> E : - - ← No EMG record

(2) Transmit the code "43-59" from the Jig RCU again.
The FDP shows the EMG detail information < 1 > in the form of " *1: *2 : 34 ".

*1 : Deck operation mode at the moment of EMG
*2 : Mechanism operation mode at the moment of EMG
3- : Mechanism sensor information at the moment of EMG
-4 : Mechanism mode position at the moment of EMG

(3) Transmit the code "43-59" from the Jig RCU once again.
The FDP shows the EMG detail information < 2 > in the form of " *5 : *6 : *7 ".

*5 : Type of the cassette tape in use < 1 > .
*6 : Winding position of the cassette tape in use
*7 : Type of the cassette tape in use < 2 > (Winding area)

(4) Transmit the code "43-59" from the Jig RCU once again.
The FDP shows the EMG detail information < 3 > in the form of "*8 : *9 : *10".

*8 : Previous deck operation mode at the moment of EMG
*9 : The deck operation mode of the one before the last at the moment of EMG
*10: The deck operation mode of the one prior to one above at the moment of EMG

(5) Transmit the code "43-59" from the Jig RCU once again to reset the display.

5.2.2 Clearing the EMG history

(1) Display the EMG history.
(2) Transmit the code "43-36" from the Jig RCU.
(3) Reset the EMG display.

5.2.3 Details of the OSD display in the EMG display mode

During the EMG display, the OSD shows the data on the deck mode, etc. The details of the display contents are as follows.

Notes:

- **The display is variable depending on the part No. of the System Control microcomputer (IC3001) built into the VCR. In the following, refer to the figure carrying the same two characters as the top two characters of the part number of your IC.**
- **The sensor information in the OSD display contents is partially different from the mechanism sensor information in EMG detail information < 1 >.**

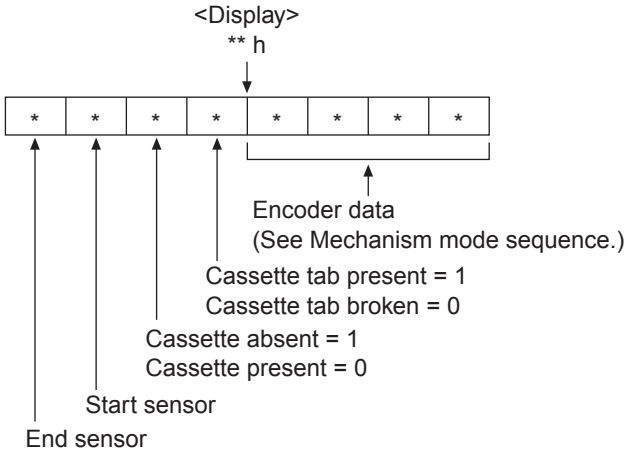
[For MN* only]

AA	BB	CC	DD	EE
FF	GG	HH	I I	J J
KK	L L	MM	NN	OO
PP	QQ	RR	SS	TT
UU	VV	WW	XX	YY

AA : Deck operation mode (See EMG detail information < 1 >.)
BB : Mechanism operation mode (See EMG detail of information < 1 >.)
CC : Mechanism transition flag
DD : Capstan motor control status
EE : Loading motor control status
FF : Sensor information (See sensor information details.)
GG : Capstan motor speed
HH : Key code (JVC code)
I I : Supply reel winding diameter data, higher 8 bits.
JJ : Supply reel winding diameter data, lower 8 bits.
KK : Mechanism sensor information & mechanism mode position(See EMG detail of information < 1 >.)
LL : Tape speed data, higher 8 bits.
MM : Tape speed data, lower 8 bits.
NN : Cassette tape type < 2 >, higher 8 bits. (See EMG detail of information < 2 >.)
OO : Cassette tape type < 2 >, lower 8 bits. (See EMG detail of information < 2 >.)
PP : General data display area

YY : General data display area

***FF:Sensor information details**

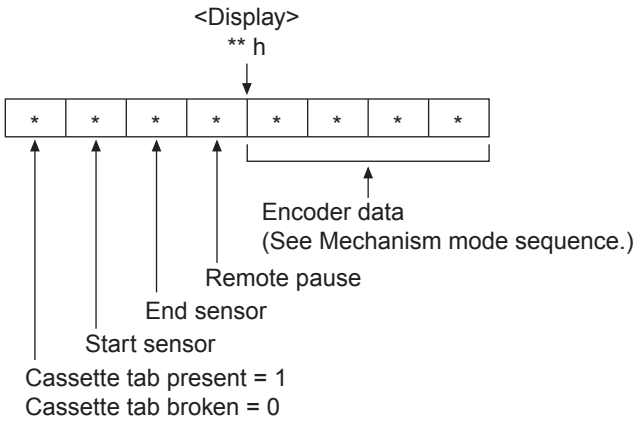


[For *HD only]

AA	BB	CC
DD	EE	FF
GGGG	HHHH	
I I	J J J J	
KKKK	L L L L	MMMM
ROM No.		

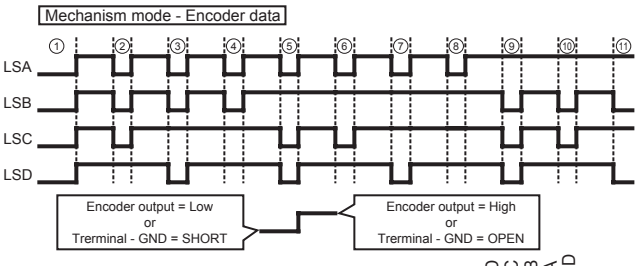
AA : Key code (JVC code)
BB : Deck operation mode(See EMG detail information < 1 >.)
CC : Mechanism operation mode (See EMG detail information < 1 >.)
DD : Sensor information (See sensor information details.)
EE : Capstan motor speed (Search, double speed)
FF : Tracking value
GGGG : Cassette tape type < 2 >, 16 bits. (See EMG detail information < 2 >.)
HHHH : Supply reel winding diameter data
I I : Capstan motor speed (FF/REW, double speed)
JJJJ : Tape speed data, lower 8 bits.
KKKK : General data display area
LLLL : General data display area
MMMM : General data display area

***DD:Sensor information details**

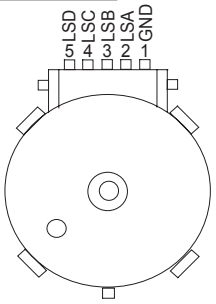


[For both MN*/HD*]

Mechanism mode sequence



No.	Position	Encoder data
①	EJECT	0 h = 0000
②	EJECT1	1 h = 0001
③	EJECT2	2 h = 0010
④	ULSTOP	3 h = 0011
⑤	UPPER	4 h = 0100
⑥	ONSTOP(PLAY)	5 h = 0101
⑦	FWD/SS	6 h = 0110
⑧	REV/SS	7 h = 0111
⑨	OFFSTOP	8 h = 1000
⑩	FFREW-BRAKE	9 h = 1001
⑪	FFREW	A h = 1010
⑫	MIDDLE	F h = 1111



5.2.4 EMG content description

Note:

EMG contents "E08/E09" are for the model with Dynamic Drum (DD).

FDP	CONTENT	CAUSE
E01: Loading EMG	If the mechanism mode does not change to the next mode within 4 seconds after the loading motor starts rotating in the loading direction, while the mechanism is in the after-loading position (with the tape up against the pole base), [E:01] is identified and the power is switched OFF. However, if the tape loading is not completed within 4 seconds after the loading motor starts rotating in the loading direction, the tape is simply unloaded and ejected. No EMG data is recorded in this case.	1. The mechanism is locked in the middle of the mode transition during a tape loading operation. 2. The mechanism overruns during the tape loading operation because the SYSCON cannot recognize the mechanism mode normally. This problem is due to a cause such as a rotary encoder failure. 3. Power is not supplied to the loading MDA. (M12V/Vcc/Vref/ICP are disconnected in the middle.)
E02: Unloading EMG	When the mechanism mode cannot be changed to another mode even when the loading motor has rotated for more than 4 seconds in the unloading direction, [E:02] is identified and the power is turned off.	1. The mechanism is locked in the middle of mode transition. 2. Without an eject signal being sent from the SYSCON, unloading is attempted (i.e. Ejection is attempted while the tape is still inside the mechanism.) because the SYSCON cannot recognize the mechanism mode normally. This is due to a cause such as a rotary encoder failure. (Mechanism position: UPPER) 3. Power is not supplied to the loading MDA. (M12V/Vcc/Vref/ICP are disconnected in the middle.)
E03: Take Up Reel Pulse EMG	When the falling edje of the take-up reel pulse has not been generated for more than 4 seconds in the capstan rotating mode, [E:03] is identified, the pinch rollers are turned off and stopped, and the power is turned off. In this case, however, the mechanism should be in position after tape loading. Note that the reel EMG is not detected during Slow/Frame advance operations.	1. The take-up reel pulse is not generated in the FWD transport modes (PLAY/FWD SEARCH/FF, etc.) because; 1)The idler gear is not meshed with the take-up reel gear because the mechanism malfunctions for some reason. 2)The idler gear is meshed with the take-up reel gear, but incapable of winding due to too large mechanical load (abnormal tension); 3)The reel is rotating normally but an FG pulse is not generated due to the take-up reel sensor failure. 2. The supply reel pulse is not generated in the REV transport modes (REV SEARCH/REW, etc.) because; 1) The idler gear is not meshed with the supply reel gear because the mechanism malfunctions for some reason. 2) The idler gear is meshed with the supply reel gear, but incapable of winding due to too large a mechanical load (abnormal tension); 3) The reel rotates normally but the FG pulse is not generated due to a supply reel sensor failure. 3. Power(SW5V) is not supplied to the reel sensor on the tape winding side.
E04: Drum FG EMG	When the drum FG pulse has not been input for more than 3 seconds in the drum rotating mode, [E:04] is identified, the pinch rollers are turned off and stopped, and the power is turned off.	1. The drum could not start or the drum rotation has stopped due to too large a load on the tape, because; 1) The tape tension is abnormally high; 2) The tape is damaged or a foreign object (grease, etc.) adheres to the tape. 2. The drum FG pulse did not reach the System controller CPU because; 1) The signal circuit is disconnected in the middle; 2) The FG pulse generator (hall device) of the drum is faulty. 3. The drum control voltage (DRUM CTL V) is not supplied to the MDA. 4. Power (M12V) is not supplied to the drum MDA.
E05: Cassette Eject EMG	If the cassette does not reach the eject position within about 0.7 seconds after the cassette housing has started the cassette ejection operation, [E:05] is identified, the drive direction is reversed to load the tape, the mode is switched to STOP mode with the pinch roller OFF, and the power is switched OFF. During the cassette insertion process, the drive direction is reversed and the cassette is ejected if the tape is not up against the pole base within about 3 seconds after the start of the cassette pulling-in operation. If the cassette does not reach the eject position within about 0.7 seconds after the drive mode reversal operation, [E:05] is identified and the power is switched OFF immediately.	1. The cassette cannot be ejected due to a failure in the drive mechanism of the housing. 2. When the housing load increases during ejection, the loading motor is stopped because of lack of headroom in its drive torque. Housing load increasing factors: Temperature environment (low temperature, etc.), mechanism wear or failure. 3. The sensor/switch for detecting the end of ejection are not functioning normally. 4. The loading motor drive voltage is lower than specified or power (M12V) is not supplied to the motor (MDA). 5. When the user attempted to eject a cassette, a foreign object (or perhaps the user's hand) was caught in the opening of the housing.
E06: Capstan FG EMG	When the capstan FG pulse has not been generated for more than 1 second in the capstan rotating mode, [E:06] is identified, the pinch rollers are turned off and stopped, and the power is turned off.However, the capstan EMG is not detected in SLOW/STILL modes. Note that, if the part number of the System Control IC begins with "MN" or "M3", the capstan EMG is not detected even during the FF/REW operation.	1. The capstan could not start or the capstan rotation has stopped due to too large a load on the tape, because; 1) The tape tension is abnormally high (mechanical lock); 2) The tape is damaged or a foreign object (grease, etc.) is adhered to the tape (occurrence of tape entangling, etc.). 2. The capstan FG pulse did not reach the System controller CPU because; 1) The signal circuit is disconnected in the middle; 2) The FG pulse generator (MR device) of the capstans is faulty. 3. The capstan control voltage (CAPSTAN CTL V) is not supplied to the MDA. 4. Power (M12V, SW5V) are not supplied to the capstan MDA.
E07: SW Power Short-Circuit EMG	When short-circuiting of the SW power supply with GND has lasted for 0.5 second or more, [E:07] is identified, all the motors are stopped and the power is turned off.	1. The SW 5 V power supply circuit is shorted with GND. 2. The SW 12 V power supply circuit is shorted with GND.
E08: DD Initialized (Absolute Position Sensor) EMG	When DD tilting does not complete in 4 seconds, [E:08] is identified, the tilt motor is stopped and the power is turned off.	1. The absolute value sensor is defective. (The soldered parts have separated.) 2. The pull-up resistor at the absolute sensor output is defective. (The soldered parts have separated.) 3. Contact failure or soldering failure of the pins of the connector (board-to-board) to the absolute value sensor. 4. The absolute value sensor data is not sent to the System Controller CPU.
E09: DD FG EMG	When the DD FG pulse is not generated within 2.5 seconds, [E:09] is identified, the tilt motor is stopped and the power is turned off.	1. The FG sensor is defective. (The soldered parts have separated.) 2. The pull-up resistor at the FG sensor output is defective. (The soldered parts have separated.) 3. Contact failure or soldering failure of the pins of the connector (board-to-board) to the FG sensor. 4. The power (5V) to the sensor is not supplied. (Connection failure/soldering failure) 5. The FG pulse is not sent to the System Controller CPU. 6. The tilt motor is defective. (The soldered parts have separated.) 7. The drive power to the tilt motor is not supplied. (Connection failure/soldering failure) 8. The tilt motor drive MDA - IC is defective. 9. Auto-recovery of the DD tilting cannot take place due to overrun.
E0A: Supply Reel Pulse EMG	When the falling edge of the supply reel pulse has not been generated for more than 10 seconds in the capstan rotating mode, [E:0A] is identified and the cassette is ejected (but the power is not turned off). In this case, however, the mechanism should be in the position after tape loading (with the tape up against the pole base). Also note that the reel EMG is not detected during Slow/Frame advance operations.	1. The supply reel pulse is not generated in the FWD transport mode (PLAY/FWD SEARCH/FF, etc.) because; 1) PLAY/FWD or SEARCH/FF is started while the tape in the inserted cassette is cut in the middle; 2) A mechanical factor caused tape slack inside and outside the supply reel side of the cassette shell. In this case, the supply reel will not rotate until the tape slack is removed by the FWD transport, so the pulse is not generated until then; 3) The reel is rotating normally but the FG pulse is not generated due to a supply reel sensor failure. 2. The take-up reel pulse is not generated in the REV transport mode (REV SEARCH/REW, etc.). 1) REV SEARCH/REW is started when the tape in the inserted cassette has been cut in the middle; 2) A mechanical factor caused tape slack inside and outside the take-up reel side of the cassette shell. In this case, the take up will not rotate until the tape slack is removed by the REV transport, so the pulse will not be generated until that time; 3) The reel is rotating normally but the FG pulse is not generated due to a take-up reel sensor failure. 3. The power (SW 5V) to a reel sensor is not supplied.
EU1: Head clog warning history	Presupposing the presence of the control pulse output in the PLAY mode, when the value obtained by mixing the two V.FM output channels (without regard to the A.FM output) has remained below a certain threshold level for more than 10 seconds, [E:U1] is identified and recorded in the emergency history. During the period in which the head clog is detected, the FDP shows "U:01" and the OSD repeats the "3 seconds of warning display" and the "7 seconds of noise picture display" alternately. EMG code : "E:C1" or "E:U1" / FDP : "U:01" / OSD : "Try cleaning tape." or "Use cleaning cassette." The head clog warning is reset when the above-mentioned threshold has been exceeded for more than 2 seconds or the mode is changed to another mode than PLAY.	

5.2.5 EMG detail information < 1 >

The status (electrical operation mode) of the VCR and the status (mechanism operation mode/sensor information) of the mechanism in the latest EMG can be confirmed based on the figure in EMG detail information < 1 > .

[FDP/OSD display] *1 : *2 : 34

*1 : Deck operation mode at the moment of EMG
*2 : Mechanism operation mode at the moment of EMG
3- : Mechanism sensor information at the moment of EMG
-4 : Mechanism mode position at the moment of EMG

Note:

- **For EMG detailed information < 1 >, the content of the code that is shown on the display (or OSD) differs depending on the parts number of the system control microprocessor (IC3001) of the VCR. The system control microprocessor parts number starts with two letters, refer these to the corresponding table.**

***1 : Deck operation mode**

[Common table of MN* and HD]

Display		Deck operation mode
MN*	HD*	
00	-	Mechanism being initialized
01	00	STOP with pinch roller pressure off (or tape present with P.OFF)
02	01	STOP with pinch roller pressure on
03	-	POWER OFF as a result of EMG
04	04	PLAY (Normal playback)
0C	0E	REC
10	11	Cassette ejected
20	22	FF
21	-	Tape fully loaded, START sensor ON, short FF
22	-	Cassette identification FWD SEARCH before transition to FF (SPx7-speed)
24	26	FWD SEARCH (variable speed) including x2-speed
2C	2E	INSERT REC
40	43	REW
42	-	Cassette identification REV SEARCH before transition to REW (SPx7-speed)
44	47	REV SEARCH (variable speed)
4C	4C	AUDIO DUB
6C	6E	INSERT REC (VIDEO + AUDIO)
84	84	FWD STILL / SLOW
85	85	REV STILL / SLOW
8C	8F	REC PAUSE
8D	-	Back spacing
8E	-	Forward spacing (FWD transport mode with BEST function)
AC	AF	INSERT REC PAUSE
AD	-	INSERT REC back spacing
CC	CD	AUDIO DUB PAUSE
CD	-	AUDIO DUB back spacing
EC	EF	INSERT REC (VIDEO + AUDIO) PAUSE
ED	-	INSERT REC (VIDEO + AUDIO) back spacing

***2 : Mechanism operation mode**

[Table of MN*]

Display	Mechanism operation mode
00	Command standby (No command to be executed)
01	Immediate Power OFF after EMG occurrence
02	Loading from an intermediate position during mechanism initialization
03	Unloading due to EMG occurrence during mechanism initialization
04	Ejecting cassette (ULSTOP to EJECT)
05	Inserting cassette (EJECT to ULSTOP)
06	Loading tape (ULSTOP to PLAY)
07	Unloading tape (PLAY to ULSTOP)
08	Transition from pinch roller ON to STOP
09	Transition from pinch roller OFF to STOP (PLAY to OFFSTOP)
0A	Transition from pinch roller OFF to STOP at power OFF
0B	Transition from pinch roller ON to STOP at power ON
0C	Transition to PLAY
0D	Transition to Search FF
0E	Transition to REC
0F	Transition to FWD STILL/SLOW
10	Transition to REV STILL/SLOW
11	Transition to Search REV
12	Transition from FF/REW to STOP
13	Transition to FF
14	Transition to REW
15	Tape end detection processing during loading
16	Short FWD/REV at tape sensor ON during unloading
17	Transition to FF/REW brake mode

[Table of HD*]

Display	Mechanism operation mode
00	STOP with pinch roller pressure off
01	STOP with pinch roller pressure on
02	U/L STOP (or tape being loaded)
04	PLAY (Normal playback)
05	PLAY (x1-speed playback using JOG)
0E	REC
11	Cassette ejected
22	FF
26	FWD SEARCH (variable speed) including x2-speed
2E	INSERT REC
43	REW
47	REV SEARCH
4C	AUDIO DUB
6E	INSERT REC (VIDEO + AUDIO)
84	FWD STILL/SLOW
85	REV STILL/SLOW
8F	REC PAUSE
AF	INSERT REC PAUSE
C7	REV SEARCH (x1-speed reverse playback using JOG)
CD	AUDIO DUB PAUSE
EF	INSERT REC (VIDEO + AUDIO) PAUSE
F0	Mechanism being initialized
F1	POWER OFF as a result of EMG
F2	Cassette being inserted
F3	Cassette being ejected
F4	Transition from STOP with pinch roller pressure on to STOP with pinch roller pressure off
F5	Transition from STOP with pinch roller pressure on to PLAY
F6	Transition from STOP with pinch roller pressure on to REC
F7	Cassette type detection SEARCH before FF/REW is being executed
F8	Tape being unloaded
F9	Transition from STOP with pinch roller pressure off to STOP with pinch roller pressure on
FA	Transition from STOP with pinch roller pressure off to FF/REW
FB	Transition from STOP with pinch roller pressure off to REC.P (T.REC,etc.)
FC	Transition from STOP with pinch roller pressure off to cassette type detection SEARCH
FD	Short REV being executed after END sensor on during unloading
FE	Tension loosening being executed after tape loading (STOP with pinch roller pressure on)
FF	Tape being unloaded

3- : Mechanism sensor information

[Common table of MN* and HD*]

Display	Mechanism sensor information			
	REC safety SW	Start sensor	End sensor	Mechansim position sensor
0-	Tab broken	ON	ON	ON
1-	Tab broken	ON	ON	OFF
2-	Tab broken	ON	OFF	ON
3-	Tab broken	ON	OFF	OFF
4-	Tab present	OFF	ON	ON
5-	Tab present	OFF	ON	OFF
6-	Tab present	OFF	OFF	ON
7-	Tab present	OFF	OFF	OFF
8-	Tab broken	ON	ON	ON
9-	Tab broken	ON	ON	OFF
A-	Tab broken	ON	OFF	ON
B-	Tab broken	ON	OFF	OFF
C-	Tab present	OFF	ON	ON
D-	Tab present	OFF	ON	OFF
E-	Tab present	OFF	OFF	ON
F-	Tab present	OFF	OFF	OFF
	Tab broken = 0 Tab present = 1	Sensor ON = 0 sensor OFF = 1	Sensor ON = 0 Sensor OFF = 1	

-4 : Mechanism mode position

[Common table of MN* and HD*]

Mechanism sensor information	Display	Deck operation mode	
Even number (0, 2, 4, 6, 8, A, C, E)	-0	Not established	
	-1	EJECT	EJECT position
	-2	EJECT-EJECT1	Intermodal position
	-3	EJECT1	EJECT1 position
	-4	EJECT1-EJECT2	Intermodal position
	-5	EJECT2	EJECT2 position
	-6	EJECT2-ULSTOP	Intermodal position
	-7	ULSTOP	ULSTOP position
	-8	ULSTOP-UPPER	Intermodal position
	-9	UPPER	Loading (unloading) tape
	-A	UPPER-ONSTOP	Intermodal position
	-B	ONSTOP	PLAY position
	-C	PLAY-FWD/SS	Intermodal position
	-D	FWD/SS	FWD (FWD Still/Slow) position
	-E	FWD/SS-REV	Intermodal position
	-F	REV	REV (REV Still/Slow) position
Odd number (1, 3, 5, 7, 9, B, D, F)	-0	REV-OFFSTOP	Intermodal position
	-1	OFFSTOP	Pinch roller OFF position
	-2	OFFSTOP-FFREWB	Intermodal position
	-3	FFREWB	FF/REW Brake position
	-4	FFREWB-FFREW	Intermodal position
	-5	FFREW	FF/REW position

5.2.6 EMG detail information < 2 >

The type of the cassette tape and the cassette tape winding position can be confirmed based on the figure in EMG detail information < 2 > .

Note:

- **EMG detail information < 2 > is the reference information stored using the remaining tape detection function of the cassette tape. As a result, it may not identify cassette correctly when a special cassette tape is used or when the tape has variable thickness.**

***5 : Cassette tape type < 1 >**

Display	Cassette tape type <1>
00	Cassette type not identified
16	Large reel/small reel (T-0 to T-15/T-130 to T-210) not classified
82	Small reel, thick tape (T-120) identified/thin tape (T-140) identified
84	Large reel (T-0 to T-60) identified
92	Small reel, thick tape (T-130) identified/thin tape (T-160 to T-210) identified
93	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) not classified
C3	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified
D3	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified
E1	C cassette, thick tape (TC-10 to TC-20) identified
E2	Small reel, thick tape (T-0 to T-100) identified
E9	C cassette, thin tape (TC-30 to TC-40) identified
F1	C cassette, thick tape/thin tape (TC-10 to TC-40) not classified

Notes:

- **Cassette tape type < 1 > is identified a few times during mode transition and the identification count is variable depending on the cassette tape type. If an EMG occurs in the middle of identification, the cassette tape type may not be able to be identified.**
- **If other value than those listed in the above table is displayed, the cassette tape type is not identified.**

***6 : Cassette tape winding position**

The cassette tape winding position at the moment of EMG is displayed by dividing the entire tape (from the beginning to the end) in 21 sections using a hex number from "00" to "14".

0 : End of winding
14 : Beginning of winding
FF : Tape position not identified

***7 : Cassette tape type < 2 > (Winding area)**

Display	Cassette tape type <2>		(Reference) Word data (Beginning) (End)
00	Cassette type not identified		
04 - 08	C cassette, thick tape	TC-10	(0497 - 0506) (0732 - 0858)
05 - 06	Small reel, thick tape	T-20	(05A9 - 0661)
05 - 0C	C cassette, thick tape	TC-20P	(0599 - 05FF) (0AA1 - 0C07)
06 - 0C	C cassette, thin tape	TC-40	(0623 - 063D) (0C41 - 0CC3)
06 - 0C	C cassette, thin tape	TC-30	(0611 - 0638) (0C0C - 0CB2)
07 - 08	Small reel, thick tape	T-40	(07CC - 08E5)
09 - 0B	Small reel, thick tape	T-60	(09FD - 0B78)
0C - 0D	Small reel, thick tape	T-80(DF-160)	(0C20 - 0DFC)
0D - 0F	Small reel, thick tape	T-90(DF-180)	(0D31 - 0F3E)
0E - 10	Small reel, thick tape	T-100	(0E43 - 107F)
10 - 12	Small reel, thin tape	T-140	(10E1 - 120C)
10 - 13	Small reel, thick tape	T-120(DF-240)	(1073 - 1313)
11 - 14	Small reel, thick tape	T-130	(1185 - 1429)
12 - 14	Small reel, thin tape	T-160	(12D3 - 141F)
13 - 14	Small reel, thin tape	T-210(DF-420)	(1373 - 14C3)
13 - 14	Small reel, thin tape	T-180(DF-360)	(1357 - 14C0)
13 - 14	Small reel, thin tape	T-168	(1395 - 14EE)
13 - 14	Small reel, thick tape	DF-300	(13A8 - 14CE)
15 - 16	Large reel	T-20	(1536 - 1618)
16 - 17	Large reel	T-30	(1647 - 175A)
17 - 18	Large reel	T-40	(1759 - 189C)
19 - 1B	Large reel	T-60	(1989 - 1B2F)

Note:

- **The values of cassette tape type < 2 > in the above table are typical values with representative cassette tapes.**

5.2.7 EMG detail information < 3 >

Three deck operation modes preceding the deck operation mode in which the EMG occurs may be confirmed based on the figures in the EMG information detail < 3 >. For the contents of the displayed information, see the table "Deck operation mode" in section "5.2.5 EMG detail information < 1 >".

JVC
Victor Company of Japan, Limited
AV & MULTIMEDIA COMPANY DIGITAL VIDEO STORAGE CATEGORY 12, 3-chome, Moriya-cho, kanagawa-ku, Yokohama, kanagawa-prefecture, 221-8528, Japan

(No.YD047)

Printed in Japan
VPT

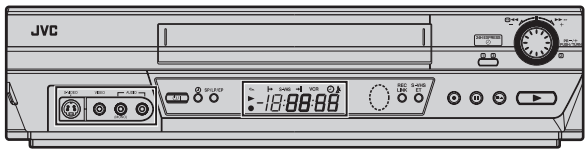
JVC

SCHEMATIC DIAGRAMS

VIDEO CASSETTE RECORDER

HR-S6970AA,HR-S6970AG, HR-S6970AH,HR-S6970AJ

CD-ROM No.SML200412



HR-S6970AA,HR-S6970AG,HR-S6970AH,HR-S6970AJ [V17S1]

G-CODE® (AA,AH mode)

G-CODE™ / SHOWVIEW™ (AG,AJ mode)

S-VHS 525/625

Hi-Fi

Super VHS ET

For disassembling and assembling of MECHANISM ASSEMBLY, refer to the SERVICE MANUAL No.86700(MECHANISM ASSEMBLY).

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No.YD047SCH
2004/12

CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components indentified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

1) All resistance values are in ohm. 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ(1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values are in μH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

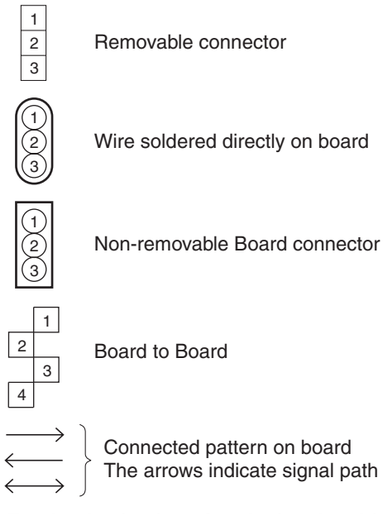
Note: The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.

2. Indications of control voltage

AUX : Active at high.

$\overline{AUX}$ or AUX(L) : Active at low.

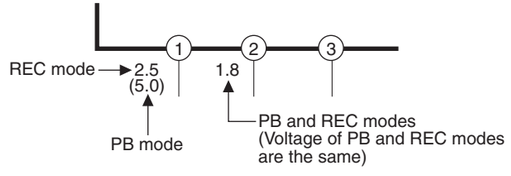
3. Interpreting Connector indications



Note: For the destination of each signal and further line connections that are cut off from the diagram, refer to "BOARD INTERCONNECTIONS"

4. Voltage measurement

1) Regulator (DC/DC CONV) circuits
   REC : Colour bar signal.
   PB : Alignment tape (Colour bar).
   — : Unmeasurable or unnecessary to measure.
2) Indication on schematic diagram
   Voltage indications for REC and PB mode on the schematic diagram are as shown below.



Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Signal path Symbols

The arrows indicate the signal path as follows.

NOTE : The arrow is DVC unique object.

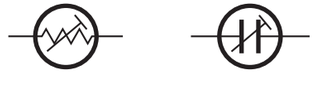
- Playback signal path
- Playback and recording signal path (including E-E signal path)
- Capstan servo path
- Drum servo path

(Example)

- R-Y — Playback R-Y signal path
- Y — Recording Y signal path

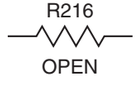
6. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



7. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.



CIRCUIT BOARD NOTES

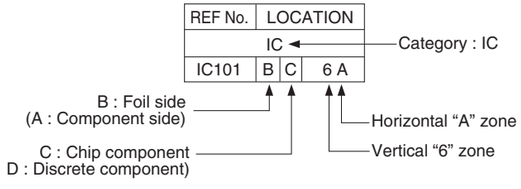
1. Foil and Component sides

1) Foil side (B side) :
   Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
   Parts on the component side seen from component face (parts face) indicated.

rts location are indicated by guide scale on the circuit board.

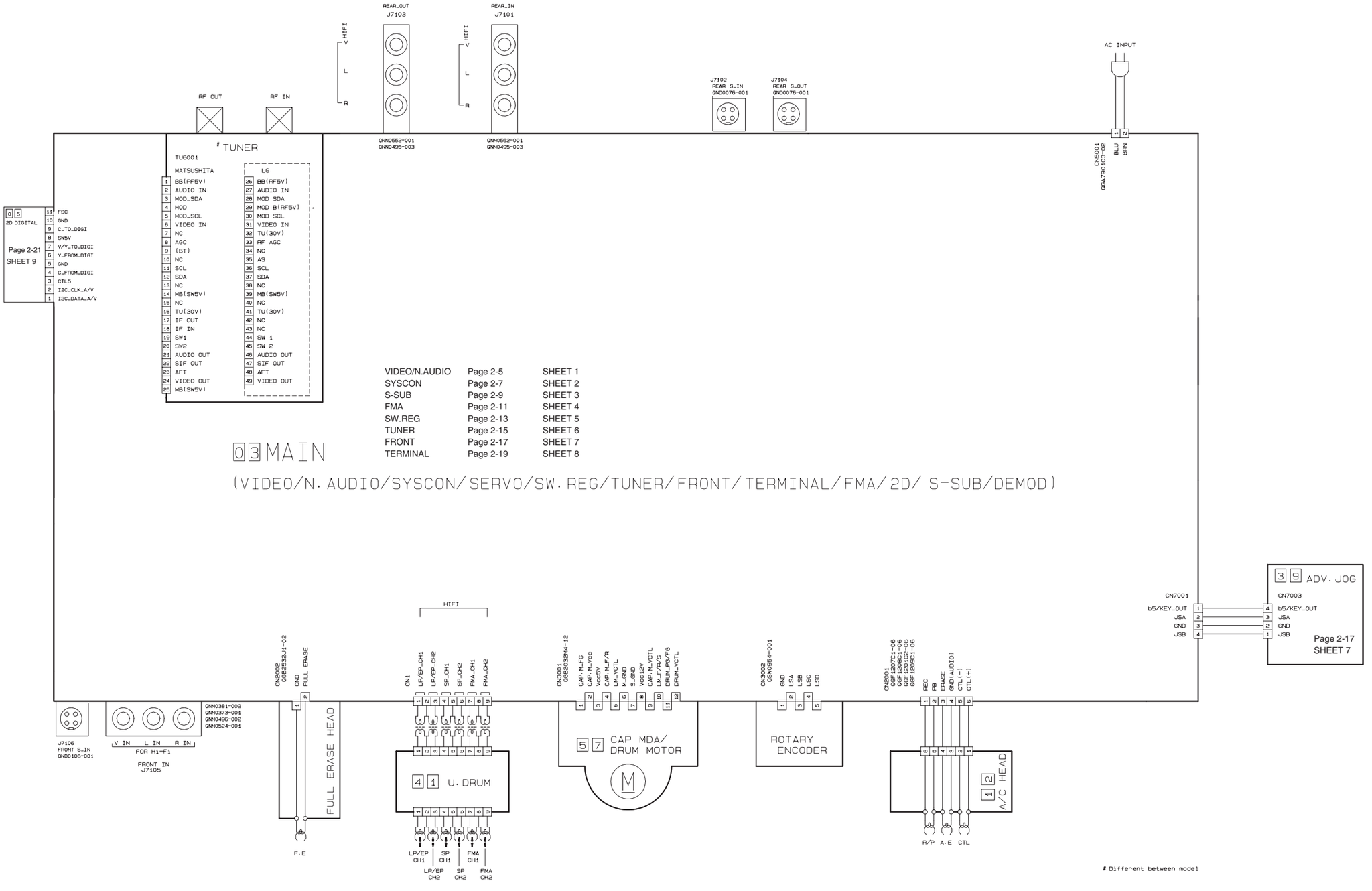
2. Parts location guides

Parts location are indicated by guide scale on the circuit board.



Note: For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

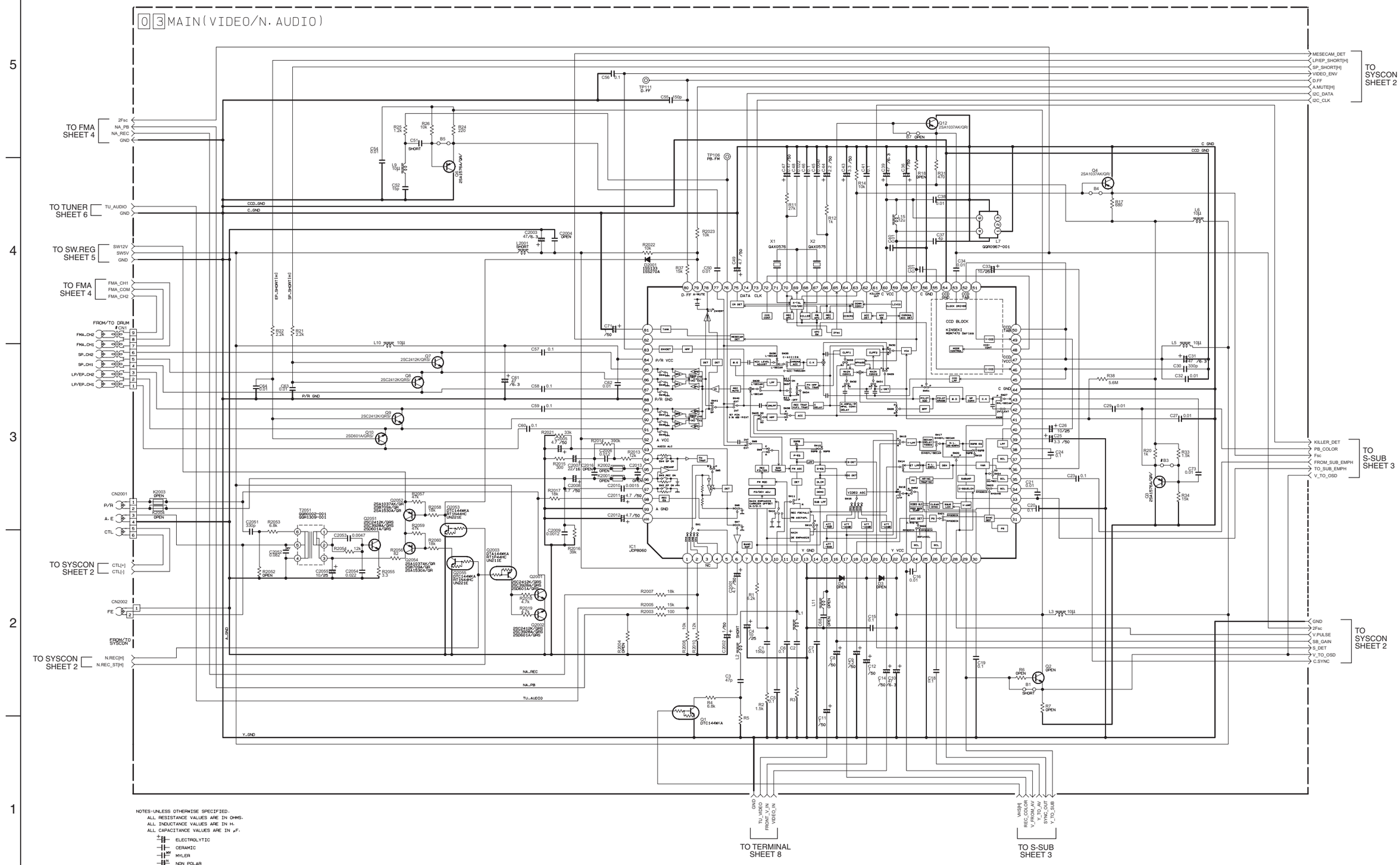
■ BOARD INTERCONNECTIONS



NO	NAME
57	CAP MDA
41	U.DRUM
39	ADV.JOG
12	A/C HEAD
05	2D_DIGITAL
03	MAIN
02	2D DIGITAL

p10673001a_rev0

■ MAIN(VIDEO/N.AUDIO) SCHEMATIC DIAGRAM



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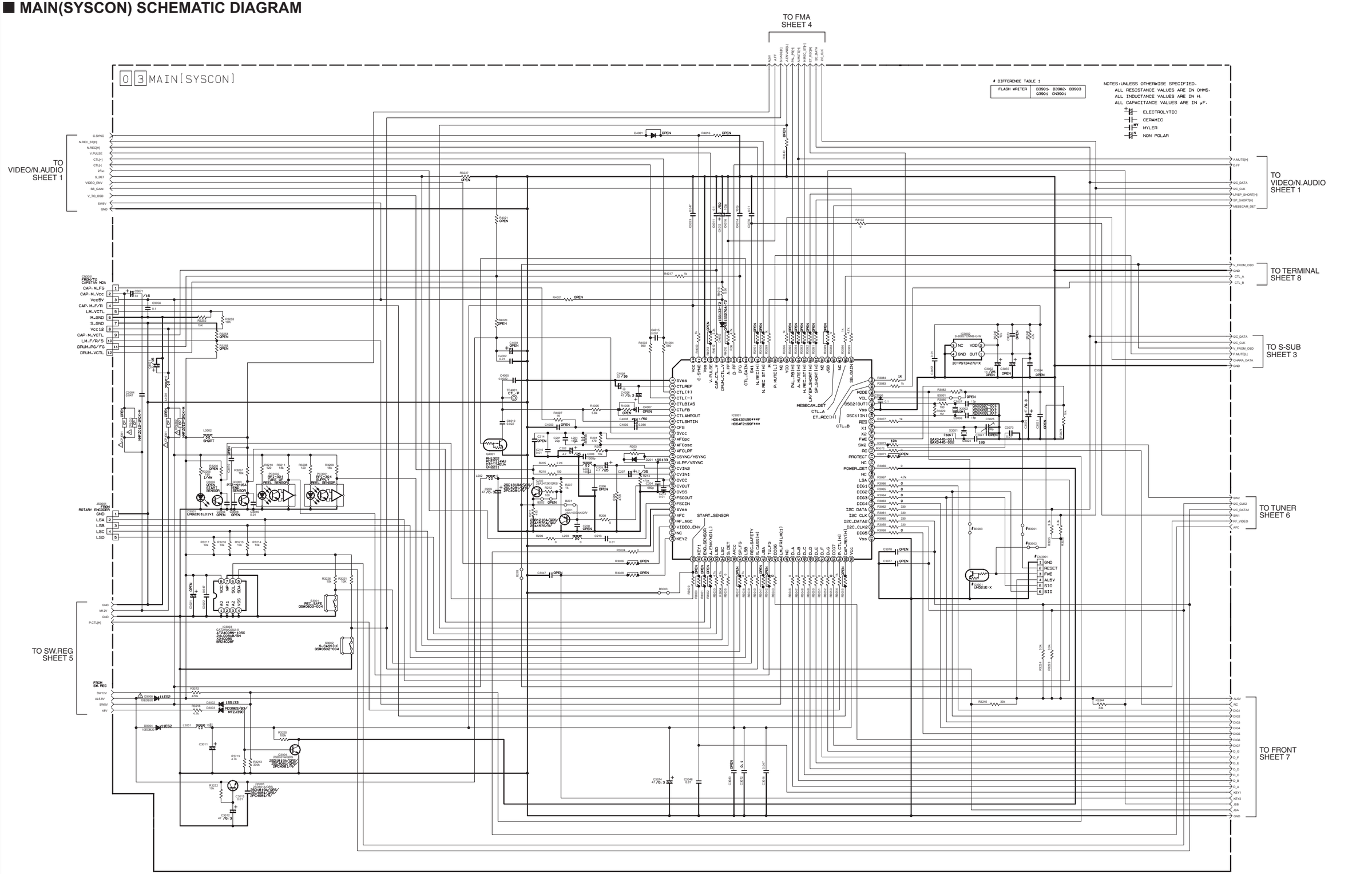
SHEET 1

■ MAIN(SYSCON) SCHEMATIC DIAGRAM



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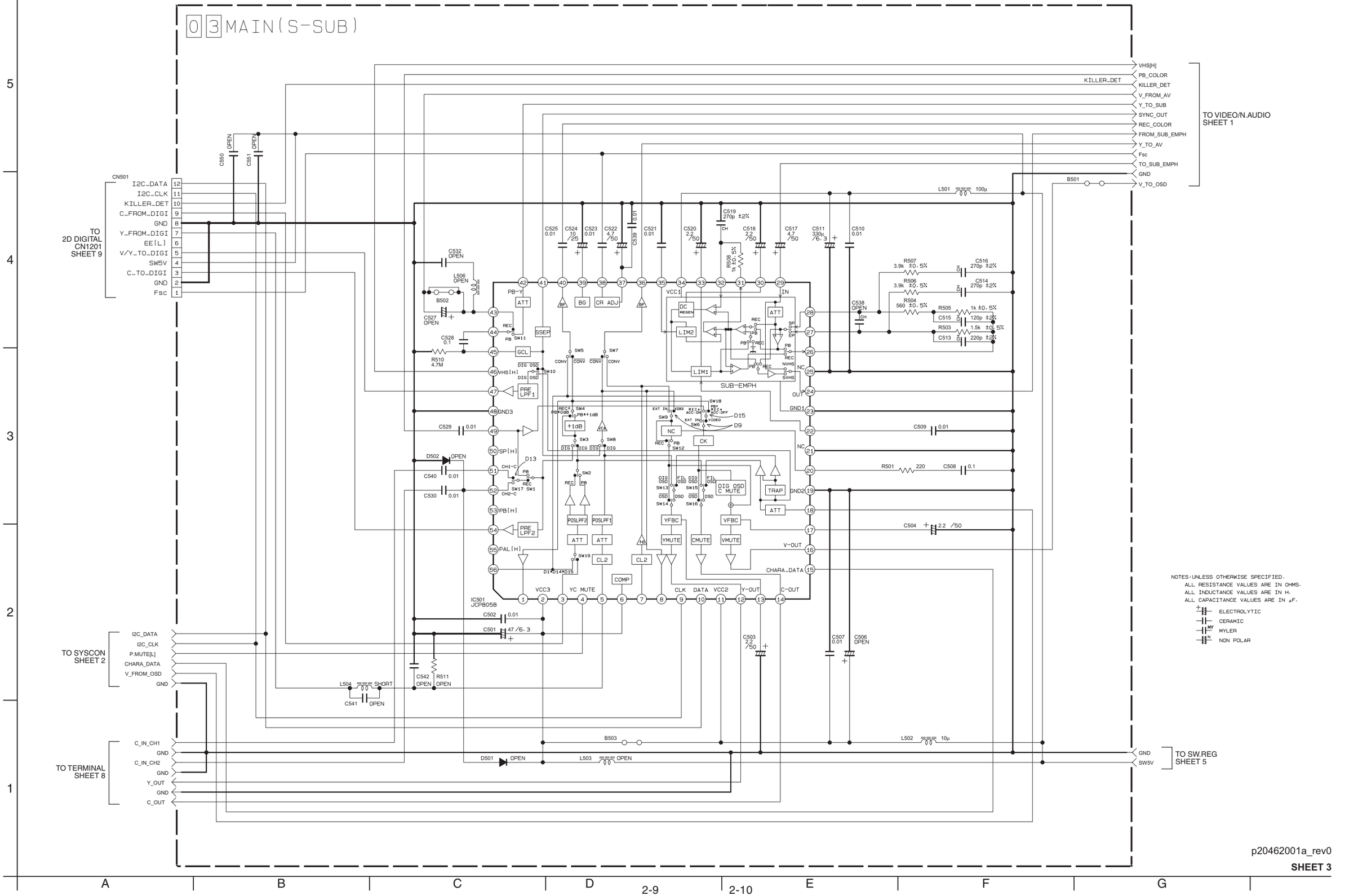
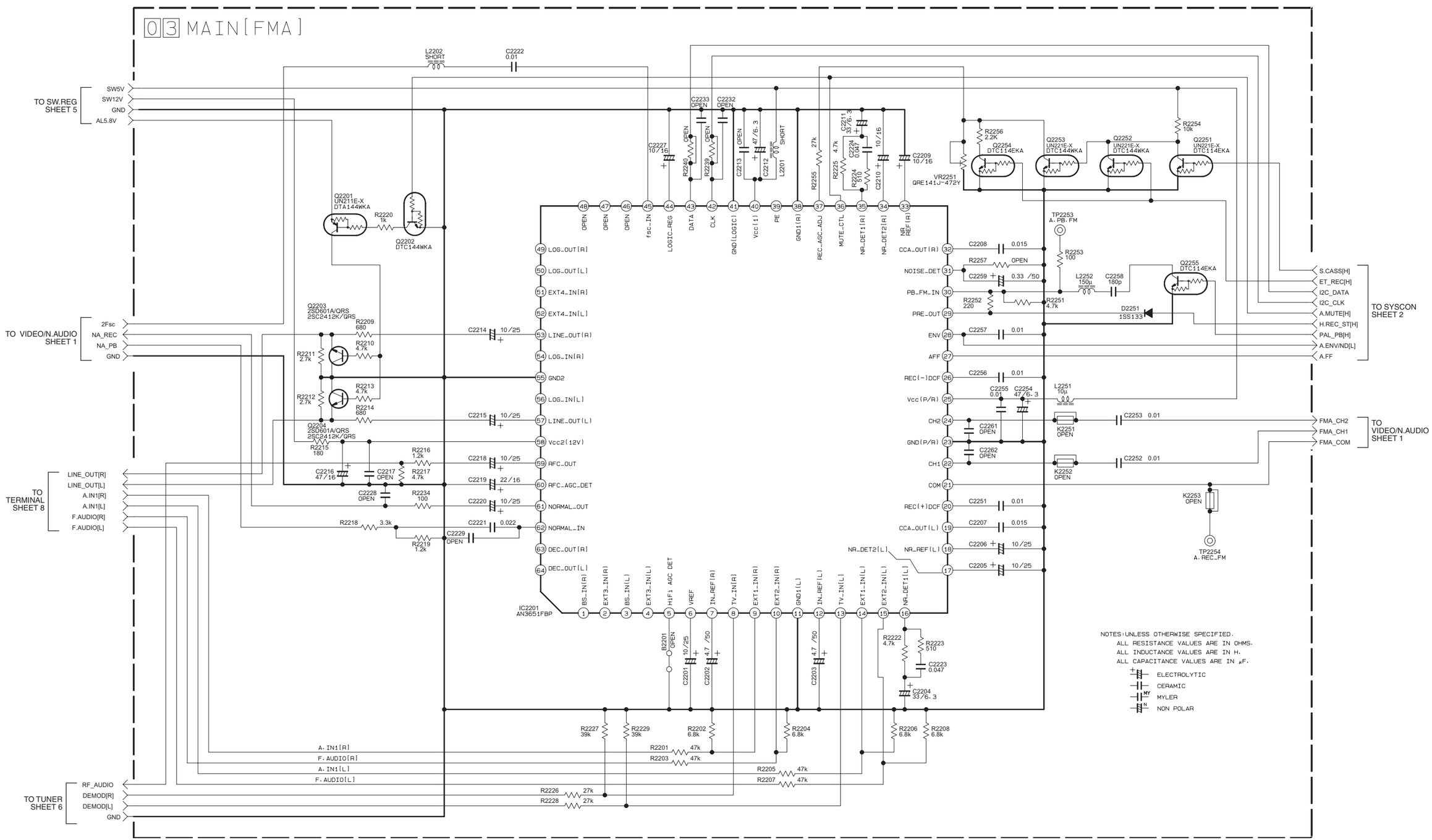
SHEET 2

■ MAIN(S-SUB) SCHEMATIC DIAGRAM



■ MAIN(FMA) SCHEMATIC DIAGRAM



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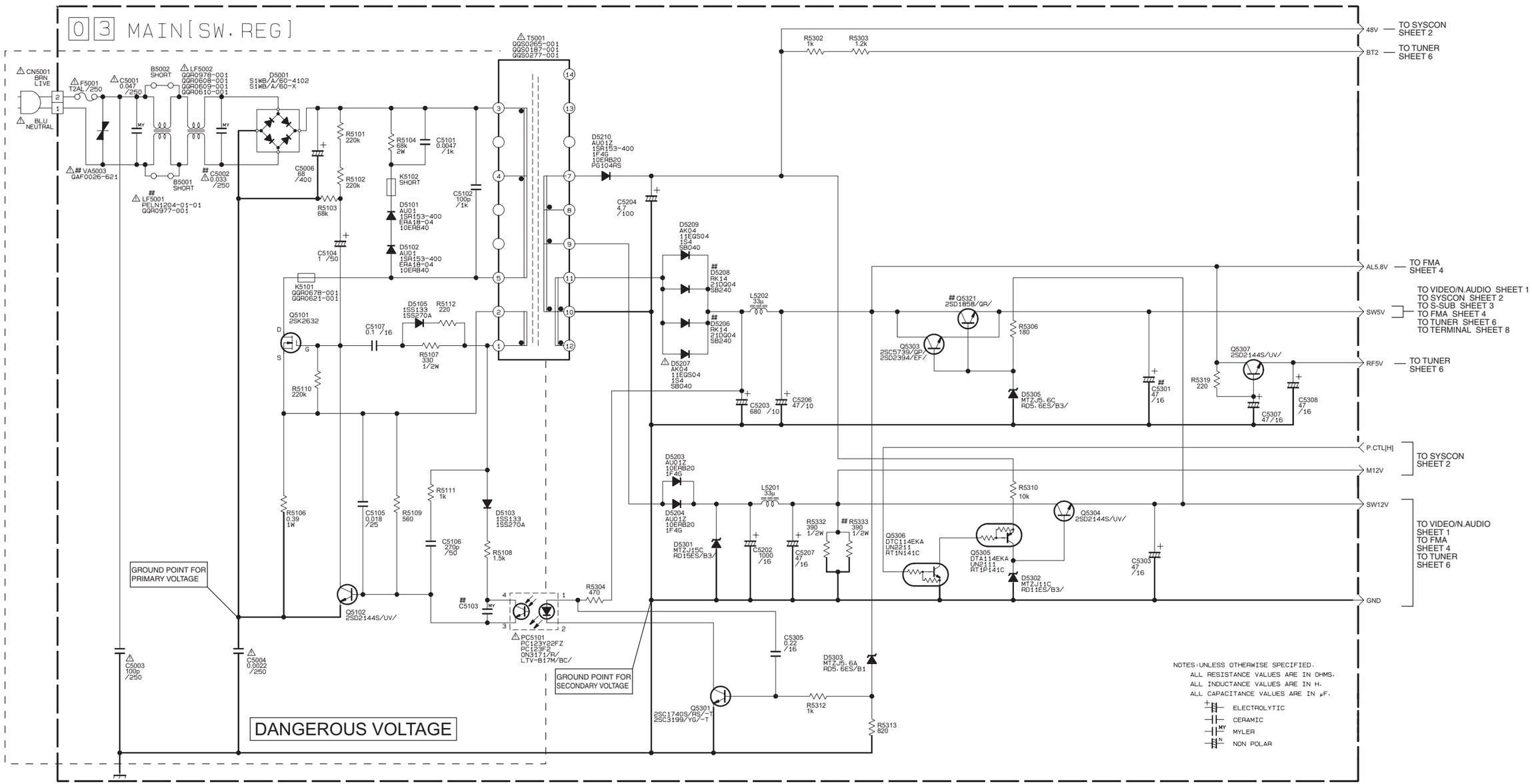
SHEET 4

■ MAIN(SWITCHING REGULATOR) SCHEMATIC DIAGRAM



p20442001a_rev0

SHEET 5

2-13 2-14

■ MAIN(TUNER) SCHEMATIC DIAGRAM

0 3 MAIN(TUNER)

#TU6001 ANT IN ANT OUT

ASIA 4 SYS
BB(RFSV) 1
AUDIO_IN 2
MOD_SDA 3
MOD_B(RFSV) 4
MOD_SCL 5
VIDEO_IN 6
NC 7
(AGC) 8
(BT) 9
NC 10
SCL 11
SDA 12
NC 13
MB(SW5V) 14
NC 15
TU(30V) 16
IF OUT 17
IF IN 18
SW_1 19
SW_2 20
AUDIO_OUT 21
SIF_OUT 22
AFT 23
VIDEO OUT 24
MB(SW5V) 25

#TU6001 ANT IN ANT OUT

LG
BB(RFSV) 26
AUDIO_IN 27
MOD_SDA 28
MOD_B(RFSV) 29
MOD_SCL 30
VIDEO_IN 31
TU(30V) 32
RF_AGC 33
NC 34
AS 35
SCL 36
SDA 37
NC 38
MB(SW5V) 39
NC 40
TU(30V) 41
NC 42
NC 43
SW_1 44
SW_2 45
AUDIO_OUT 46
SIF_OUT 47
AFT 48
VIDEO_OUT 49

#L6002 0.0
R6051 SHORT
R6056 100
C6056 OPEN
R6050 100
C6013 0.01
C6053 OPEN
R6051 100
#C6014 0.01
R6052 100
C6052 OPEN
#C6016 0.01
C6055 OPEN
#L6001 0.0
R6020 1k
C6020 OPEN
R6021 1k
C6021 OPEN
C6007 OPEN
#C6008 0.01
#C6006 0.01
C6005 OPEN
D6002 HZ30-2L
C6027 0.01
C6026 OPEN
L6502 SHORT

IC6701
MSP3417D
MSP3417D03
MSP3417G
MSP3417GD0BV3X

DIGITAL GND
ANALOG GND
C6718 OPEN
K6706 600
C6716 0.0022
R6715 12k
R6713 12k
C6715 2.2/50
C6717 2.2/50
R6714 1k
C6714 0.0022
R6716 47
R6712 1k
C6719 10/16
R6720 5.6k
C6721 0.01
C6720 10/16
R6721 5.6k
C6726 OPEN
C6725 OPEN
C6722 OPEN
C6723 0.01
K6701 600
K6702 600
R6707 OPEN
C6706 OPEN
C6707 47p
C6709 2p
C6708 8p
C6704 0.01
R6719 10k
X6701 16.432MHz
L6501 1μ
C6057 10/25
C6058 0.01
R6711 470K
C6713 0.22
C6712 OPEN
K6705 600
R6710 OPEN
K6704 600
R6709 1k
C6711 OPEN
K6703 600
R6708 10k
C6710 OPEN
R6631 270
R6032 0
C6037 10/50
R6030 1k
R6033 OPEN
C6032 OPEN
Q6030 2SB709A/QR

GND
RF5V
SW5V
SW12V
BT2
TO SW.REG SHEET 5

DEMOD[L]
GND
DEMOD[R]
TO FMA SHEET 4

GND
TU_VIDEO
TO TERMINAL SHEET 8

RF_AUDIO
TU_AUDIO
GND
TO FMA SHEET 4
TO VIDEO/N.AUDIO SHEET 1

I2C_CLK2
I2C_DATA2
AFC
SW1
SW2
RF_VIDEO
TO SYSCON SHEET 2

#DIFFERENCE TABLE

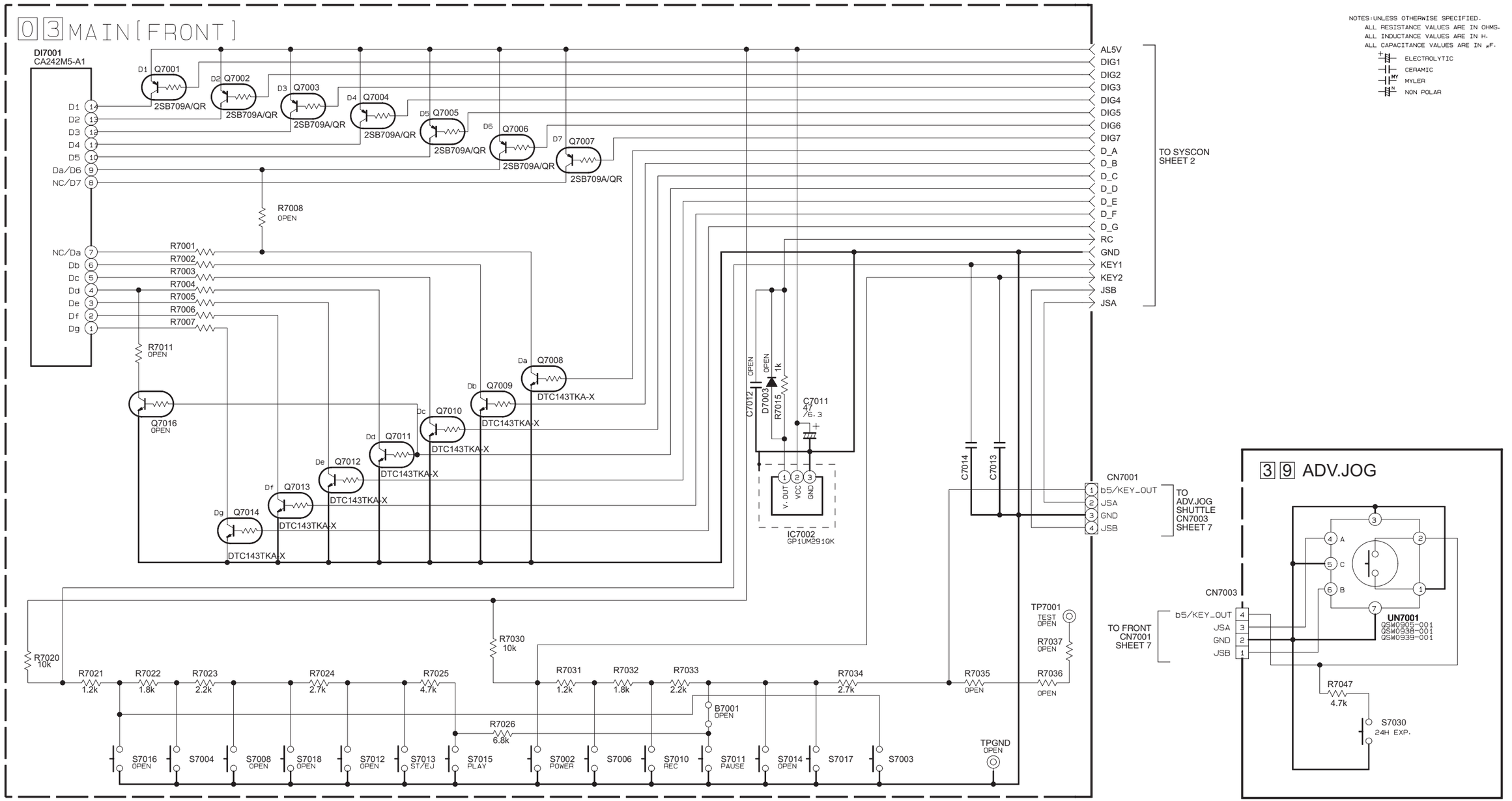
		PAL	4 SYSTEMS
		AA, AG	AJ, AH
TUNER UNIT	TU6001	LG QAU0323	MECOM QAU0236
BEAT C/M	L6001	SHORT	1μ
	L6002	10μ	1μ
	C6005 C6008 C6014 C6016	OPEN	0.01

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.
ELECTROLYTIC
CERAMIC
MY MYLER
NON POLAR

p10671001a_rev0

SHEET 6

■ MAIN(FRONT) AND ADV.JOG SHUTTLE SCHEMATIC DIAGRAMS



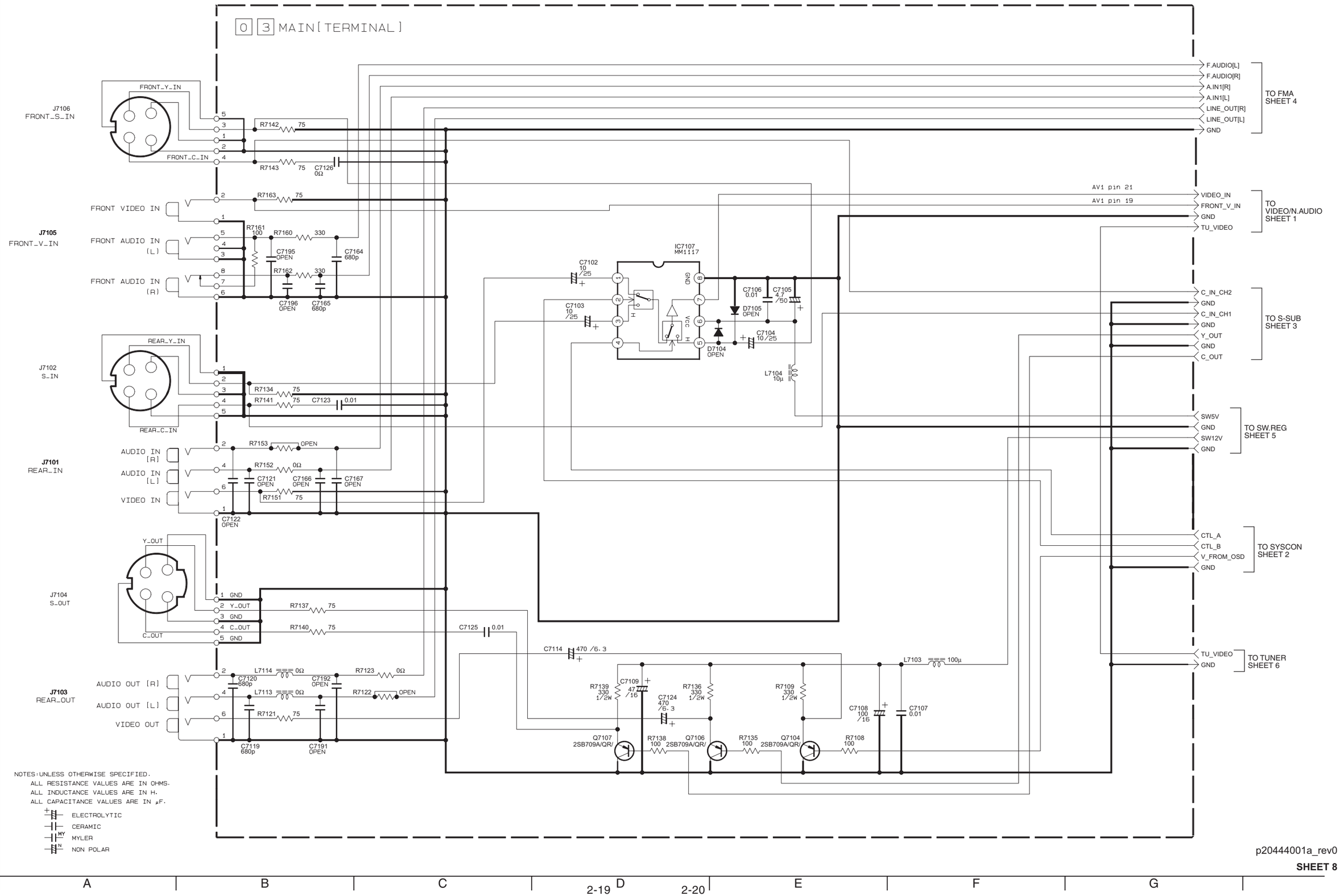
NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

ELECTROLYTIC
CERAMIC
MYLER
NON POLAR

p20409001a_rev0

SHEET 7

■ MAIN(TERMINAL) SCHEMATIC DIAGRAM



NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN µF.

+ ELECTROLYTIC
CERAMIC
MY MYLER
N NON POLAR

p20444001a_rev0

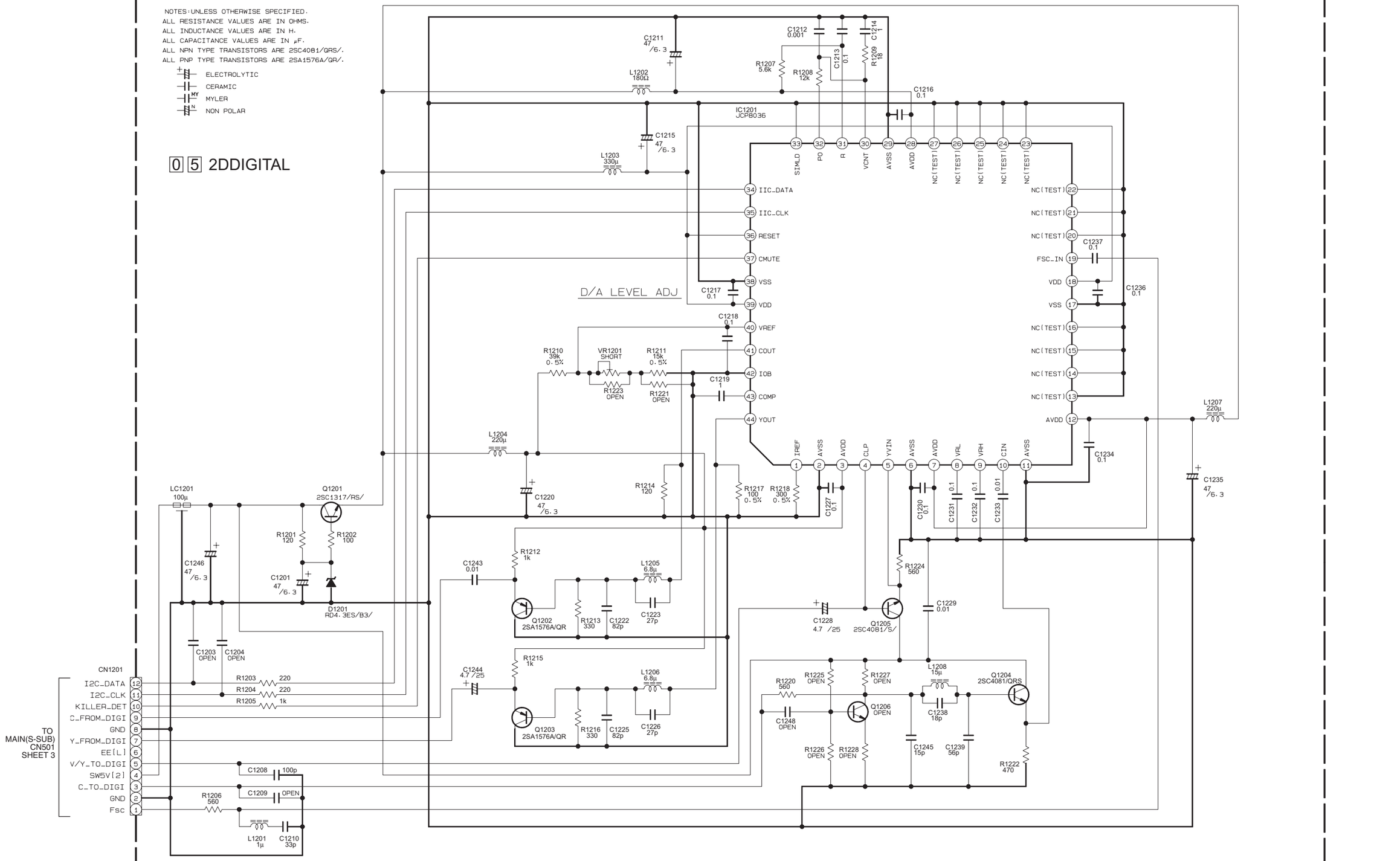
SHEET 8

■ 2D DIGITAL SCHEMATIC DIAGRAM

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.
ALL NPN TYPE TRANSISTORS ARE 2SC4081/QRS/.
ALL PNP TYPE TRANSISTORS ARE 2SA1576A/QR/.

ELECTROLYTIC
CERAMIC
MYLER
NON POLAR

05 2DDIGITAL

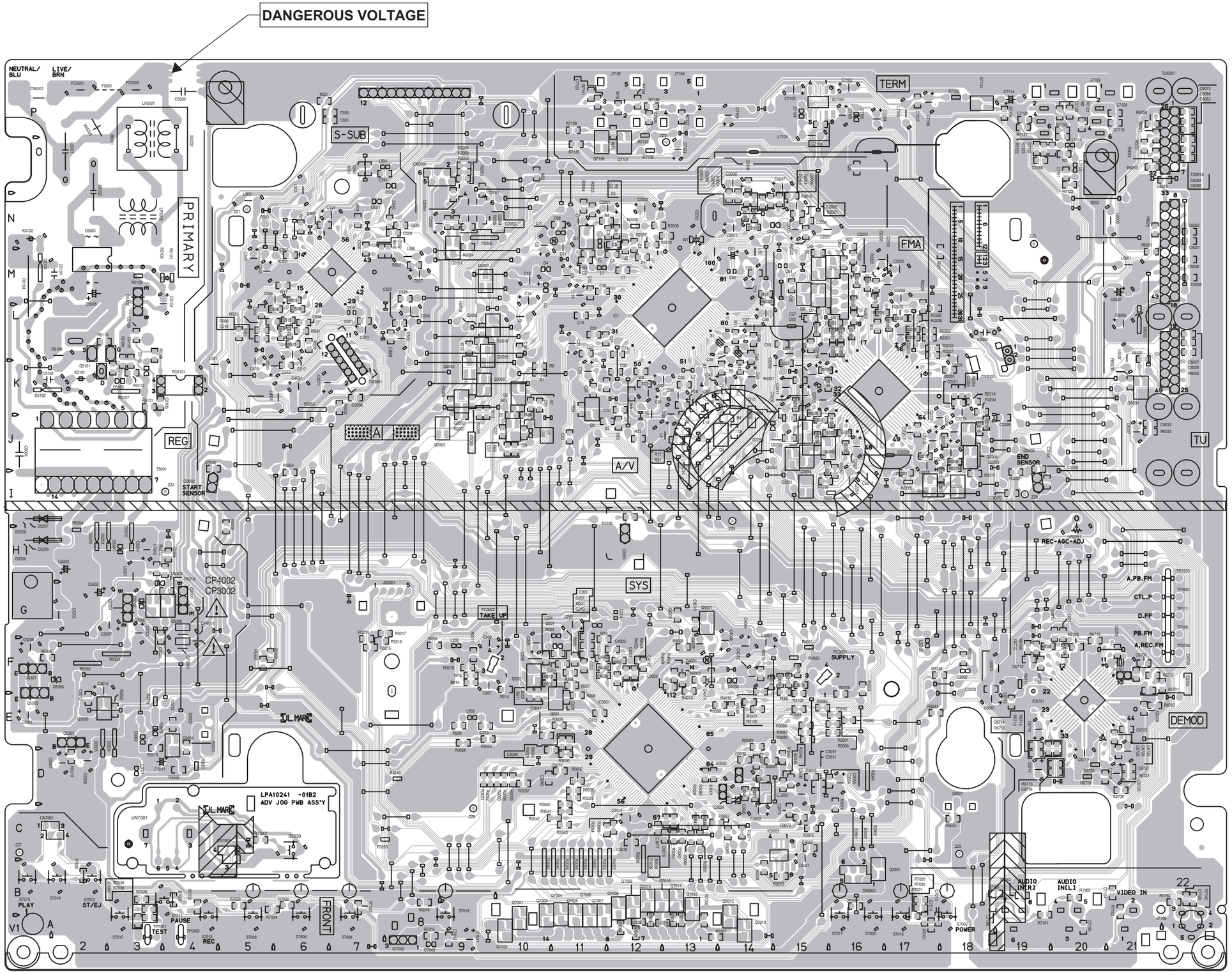


p20282001a_rev0

SHEET 9

■ MAIN CIRCUIT BOARD

<03>MAIN
LPB10241-001B



COMPONENT PARTS LOCATION GUIDE <MAIN> LPB10241-001B

REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
CAPACITOR		C2007	A D 14O	C5107	B C 2K	D5208	A D 2I	Q7003	B C 10A	R2234	B C 18K	R4016	B C 13F	K5101	A D 2K
C1	B C 12N	C2008	A D 14O	C5202	A D 2G	D5209	A D 2H	Q7004	B C 11B	R2239	B C 15I	R4017	B C 15F	K5102	A D 1N
C2	B C 11M	C2009	B C 14N	C5203	A D 1H	D5210	A D 3I	Q7005	B C 11A	R2240	B C 15I	R4020	A D 15F	K6701	B C 21F
C3	B C 11N	C2010	B C 14N	C5204	A D 3H	D5301	A D 3H	Q7006	B C 11A	R2251	B C 15K	R4021	B C 15F	K6702	B C 21F
C4	A D 11N	C2011	A D 14N	C5206	A D 1F	D5302	A D 3G	Q7007	B C 11A	R2252	B C 15K	R5101	A D 4M	K6703	B C 20F
C5	B C 11N	C2012	A D 13M	C5207	A D 2G	D5303	A D 3G	Q7008	B C 12B	R2253	B C 15K	R5102	A D 3M	K6704	B C 20F
C6	B C 11M	C2013	B C 14N	C5301	A D 1E	D5305	A D 2F	Q7009	B C 12B	R2254	A D 16I	R5103	A D 3M	K6705	B C 19F
C7	B C 12M	C2016	B C 14O	C5303	A D 3G	D6002	A D 21L	Q7010	B C 12B	R2255	B C 15J	R5104	A D 1L	K6706	B C 21D
C8	A D 10M	C2051	B C 9N	C5305	B C 3H	D7003	A D 8A	Q7011	B C 13B	R2256	B C 15J	R5106	A D 2L	LF5001	A D 4P
C9	A D 11M	C2052	A D 18L	C5307	A D 2D	D7104	A D 15P	Q7012	B C 13B	R2257	B C 15K	R5107	A D 2K	LF5002	A D 3N
C10	A D 11M	C2053	B C 9N	C5308	A D 2D	D7105	A D 16P	Q7013	B C 14A	R3024	B C 9E	R5108	B C 3L	PC3001	A D 15F
C11	A D 11N	C2054	B C 9N	C6005	A D 21L	DI7001	A D 12A	Q7014	B C 14A	R3026	B C 9E	R5109	B C 3K	PC3002	A D 9F
C12	A D 10M	C2055	A D 8N	C6006	B C 22M			Q7016	B C 12B	R3028	B C 10E	R5110	B C 2L	PC04042	A D 21F
C14	A D 10M	C2201	A D 18L	C6007	A D 21M	**FUSE**		Q7104	B C 18P	R3029	B C 11E	R5111	B C 3K	PC5101	A D 4K
C15	B C 11M	C2202	A D 17M	C6008	B C 22M	F5001	A D 2P	Q7106	B C 11O	R3030	B C 11D	R5112	B C 3K	S3001	A D 18C
C16	B C 11M	C2203	A D 17L	C6013	B C 22P	FC5001	A D 2P	Q7107	B C 12O	R3031	B C 9D	R5302	B C 5F	S3002	A D 4E
C18	B C 10L	C2204	A D 16M	C6014	B C 22O	FC5002	A D 3P			R3032	B C 9D	R5303	B C 5F	S7002	A D 17B
C19	B C 11L	C2205	A D 17M	C6016	B C 21O			**RESISTOR**		R3033	B C 9D	R5304	A D 2H	S7003	A D 16B
C20	B C 11L	C2206	A D 16M	C6020	B C 22N	**IC**		R1	B C 12M	R3034	B C 9D	R5306	B C 1F	S7004	A D 7B
C21	B C 11L	C2207	B C 16M	C6021	B C 22N	IC1	B C 13L	R2	B C 12N	R3035	B C 10D	R5310	B C 3H	S7006	A D 6B
C23	B C 11J	C2208	B C 15K	C6027	B C 22L	IC501	B C 6M	R3	B C 11M	R3037	B C 11D	R5312	B C 3H	S7008	A D 5B
C24	B C 12L	C2209	A D 15K	C6028	B C 22L	IC2201	B C 16K	R4	B C 11N	R3038	B C 11D	R5313	B C 3G	S7010	A D 4B
C25	A D 11L	C2210	A D 15K	C6032	B C 21J	IC3001	B C 12D	R5	B C 12N	R3039	B C 11D	R5319	B C 2D	S7011	A D 3B
C26	A D 11K	C2211	A D 15K	C6037	A D 21J	IC3002	B C 14D	R6	B C 10K	R3040	B C 11C	R5332	A D 2F	S7012	A D 3B
C27	B C 11L	C2212	A D 16I	C6052	B C 22O	IC3003	B C 14C	R7	B C 10K	R3041	B C 11C	R5333	A D 2F	S7013	A D 2B
C29	B C 11K	C2213	B C 16J	C6053	B C 22P	IC6701	B C 20E	R11	B C 14L	R3042	B C 10C	R6020	B C 21N	S7014	A D 1B
C30	B C 12K	C2214	A D 17J	C6055	B C 22O	IC7002	A D 8A	R12	B C 14K	R3043	B C 11C	R6021	B C 21M	S7015	A D 1B
C31	A D 12K	C2215	A D 17J	C6056	B C 22P	IC7107	B C 15P	R14	B C 14K	R3046	A D 10C	R6030	B C 21K	S7016	A D 17B
C32	B C 12K	C2216	A D 17J	C6057	A D 18E			R17	B C 13J	R3047	A D 10B	R6031	B C 21L	S7017	A D 16B
C33	A D 12K	C2217	B C 17J	C6058	B C 18F	**COIL**		R18	B C 13K	R3048	A D 11B	R6032	B C 22L	S7018	A D 8B
C34	B C 13J	C2218	A D 18J	C6704	B C 21F	L1	A D 11M	R20	B C 12J	R3049	A D 11B	R6033	B C 21J	S7030	A D 6C
C35	B C 13K	C2219	A D 18K	C6706	B C 21E	L3	A D 11N	R21	B C 16N	R3050	A D 11B	R6050	B C 21O	T2051	A D 9N
C36	A D 13K	C2220	A D 17J	C6707	B C 21F	L3	A D 10L	R22	B C 16M	R3051	A D 11B	R6051	B C 21O	T5001	A D 3I
C37	B C 13K	C2221	B C 18K	C6708	B C 21F	L5	A D 12K	R24	B C 10K	R3052	A D 11B	R6052	B C 21O	TP106	A D 21G
C38	B C 13J	C2222	B C 17I	C6709	B C 21F	L6	A D 12J	R25	B C 10J	R3053	A D 11C	R6056	B C 21P	TP111	A D 21G
C39	A D 12J	C2223	B C 16M	C6710	B C 19G	L7	A D 13K	R26	B C 10K	R3054	B C 11C	R6707	B C 21E	TP2253	A D 21H
C40	B C 13K	C2224	B C 15J	C6711	B C 20G	L9	A D 10J	R31	B C 13J	R3055	B C 11C	R6708	B C 19F	TP2254	A D 21F
C41	B C 13K	C2227	A D 16J	C6712	B C 19F	L10	A D 14N	R33	B C 12J	R3058	A D 12C	R6709	B C 19F	TP4001	A D 21G
C43	A D 13K	C2228	B C 18J	C6713	B C 19E	L11	A D 10N	R34	B C 11K	R3059	B C 12C	R6710	B C 19F	TP7001	A D 3A
C44	A D 14K	C2229	B C 18K	C6714	B C 19E	L15	A D 13J	R36	B C 15F	R3060	B C 13C	R6711	A D 19E	TPGND	A D 4A
C45	B C 14L	C2232	B C 15J	C6715	A D 19E	L201	A D 11G	R37	B C 14M	R3061	B C 13C	R6712	B C 19E	TU6001	A D 22P
C46	B C 14L	C2233	B C 16J	C6716	B C 19D	L202	A D 8F	R38	B C 11K	R3062	B C 13C	R6713	B C 19D	UN7001	A D 3C
C47	A D 14L	C2251	B C 16M	C6717	A D 19D	L203	A D 9E	R201	B C 11F	R3063	B C 13C	R6714	B C 19E	VA5003	A D 2O
C48	B C 14L	C2252	B C 16M	C6718	B C 20D	L204	A D 11G	R202	B C 11F	R3064	B C 13C	R6715	B C 19D	VR2251	A D 20H
C49	A D 14L	C2253	B C 15L	C6719	A D 20D	L501	A D 4K	R203	B C 10F	R3065	B C 13C	R6716	A D 20D	X1	A D 13L
C50	B C 9J	C2254	A D 15L	C6720	A D 21D	L502	A D 5N	R204	B C 11F	R3066	B C 13C	R6719	B C 20F	X2	A D 14K
C51	B C 10J	C2255	B C 15L	C6721	B C 21D	L503	A D 6N	R205	B C 8F	R3067	B C 13C	R6720	A D 20D	X3001	A D 13D
C52	B C 10J	C2256	B C 16L	C6722	A D 21E	L504	A D 8O	R207	B C 11F	R3069	B C 14C	R6721	B C 21D	X3002	A D 14D
C54	B C 10K	C2257	B C 15K	C6723	B C 21E	L506	A D 8M	R208	B C 11E	R3071	B C 14C	R7001	B C 12A	X6701	A D 21F
C55	B C 14L	C2258	B C 15J	C6725	B C 21D	L2001	A D 15N	R209	B C 9E	R3072	B C 15C	R7002	B C 12A		
C56	B C 14M	C2259	A D 15K	C6726	B C 20E	L2201	A D 16I	R210	B C 9F	R3073	B C 15C	R7003	B C 12A		
C57	B C 15L	C2261	B C 16L	C7011	A D 9A	L2202	A D 17F	R211	B C 10E	R3074	B C 15C	R7004	B C 13A		
C58	B C 15M	C2262	B C 16L	C7012	B C 8A	L2251	A D 14L	R212	B C 10F	R3077	B C 14D	R7005	B C 13A		
C59	B C 15M	C3004	B C 3G	C7013	B C 17A	L2252	A D 15K	R214	B C 10F	R3080	B C 13D	R7006	B C 13A		
C60	B C 16M	C3008	B C 19J	C7014	B C 17A	L3001	A D 3D	R501	B C 6M	R3082	B C 15D	R7007	B C 13A		
C61	A D 14M	C3011	A D 3D	C7102	A D 16P	L3002	A D 18F	R503	B C 5L	R3083	B C 14E	R7008	B C 12A		
C62	A D 14M	C3012	A D 2F	C7103	A D 15P	L4001	A D 5K	R504	B C 6L	R3084	A D 16D	R7011	B C 12A		
C63	B C 15L	C3013	B C 2E	C7104	A D 16P	L5201	A D 3H	R505	B C 5L	R3085	B C 15E	R7015	B C 8A		
C64	A D 15M	C3014	A D 12C	C7105	A D 16P	L5202	A D 1G	R506	B C 5L	R3086	B C 15E	R7020	B C 17B		
C68	B C 10N	C3016	B C 12C	C7106	B C 15P	L6001	A D 21M	R507	B C 6L	R3088	B C 15E	R7021	B C 17A		
C71	A D 14M	C3021	A D 15C	C7107	B C 17P	L6002	A D 20N	R508	B C 6L	R3089	B C 15E	R7022	B C 16B		
C73	B C 12K	C3022	B C 15C	C7108	A D 17P	L6501	A D 18F	R510	B C 7M	R3091	B C 15E	R7023	B C 7B		
C201	B C 11G	C3024	B C 14D	C7109	A D 14P	L6502	A D 21L	R511	B C 7O	R3092	B C 16E	R7024	B C 5B		
C202	A D 11G	C3025	A D 14C	C7114	A D 18P	L7103	A D 17P	R2003	B C 11N	R3093	B C 15E	R7025	B C 2B		
C203	B C 11F	C3030	A D 15D	C7119	B C 20P	L7104	A D 15P	R2004	B C 11N	R3094	B C 15E	R7026	B C 3B		
C204	B C 11F	C3031	B C 15D	C7120	B C 20P	L7113	A D 20O	R2005	A D 12N	R3095	B C 15E	R7030	B C 17B		
C205	A D 10F	C3033	B C 12F	C7121	B C 19P	L7114	A D 20O	R2007	B C 12N	R3096	B C 14E	R7031	B C 17A		
C206	B C 10F	C3036	B C 14D	C7122	B C 19P			R2008	B C 12N	R3099	B C 13E	R7032	B C 6B		
C207	A D 9F	C3037	B C 14D	C7123	B C 11P	**TRANSISTOR**		R2010	B C 12N	R3100	B C 14E	R7033	B C 4B		
C208	B C 11E	C3041	B C 14D	C7124	A D 13O	Q1	B C 11N	R2013	B C 14N	R3101	B C 14E	R7034	B C 5B		
C209	A D 9F	C3045	B C 19I	C7125	B C 12P	Q2	B C 10K	R2014	B C 14N	R3102	B C 15E	R7035	B C 3B		
C210	B C 11F	C3046	B C 4J	C7126	B C 22B	Q3	B C 11K	R2015	B C 15N	R3205	B C 12I	R7036	B C 3A		
C212	B C 11E	C3047	B C 10E	C7164	B C 20B	Q4	B C 13J	R2016	B C 14N	R3206	B C 4H	R7037	B C 3A		
C213	B C 9E	C3048	B C 10D	C7165	B C 18B	Q6	B C 10J	R2017	B C 14N	R3207	B C 19I	R7047	B C 5C		
C214	A D 12G	C3050	B C 14D	C7166	B C 19O	Q7	B C 15M	R2018	B C 9L	R3208	B C 16E	R7108	B C 19P		
C501	A D 6N	C3052	A D 14C	C7167	B C 20P	Q8	B C 15M	R2019	B C 9L	R3209	B C 16F	R7109	A D 17P		
C502	B C 6N	C3053	B C 15D	C7191	B C 20O	Q9	B C 15M	R2021	B C 15N	R3210	B C 9F	R7121	B C 20P		
C503	A D 5M	C3054	B C 15D	C7192	B C 19O	Q10	B C 15M	R2022	B C 15N	R3211	B C 9F	R7122	B C 20O		
C504	A D 5M	C3055	A D 16D	C7195	B C 20A	Q12	B C 14K	R2023	B C 14M	R3212	B C 4E	R7123	B C 19O		
C506	A D 5M	C3056	B C 7K	C7196	B C 18B	Q201	B C 10E	R2052	B C 9O	R3213	B C 4E	R7134	B C 12P		
C507	B C 6M	C3057	B C 15D			Q202	B C 10F	R2053	B C 9O	R3214	B C 7F	R7135	B C 11O		
C508	B C 5L	C3070	B C 19I	**CONNECTOR**		Q2001	B C 9M	R2054	B C 9N	R3215	B C 7F	R7136	A D 12O		
C509	B C 6L	C3071	A D 6K	CN1	A D 16M	Q2002	B C 9L	R2055	B C 8N	R3216	B C 7F	R7137	B C 13P		
C510	A D 7L	C3072	B C 11D	CN501	A D 9P	Q2003	B C 9K	R2056	A D 9N	R3217	B C 7G	R7138	B C 11P		
C511	A D 7L	C3073	B C 15C	CN2001	A D 9O	Q2051	B C 9N	R2057	B C 9J	R3218	A D 3F	R7139	A D 12P		
C513	B C 7L	C3076	B C 15F	CN2002	A D 18L	Q2052	B C 9K	R2058	B C 9K	R3219	B C 3E	R7140	B C 12P		
C514	B C 5L	C3077	B C 12C	CN3001	A D 7L	Q2053	B C 8J	R2059	B C 9K	R3220	B C 4D	R7141	B C 11P		
C515	B C 6L	C3078	B C 12C	CN3901	A D 16B	Q2054	B C 9K	R2060	B C 9K	R3221	A D 4D	R7142	B C 22B		
C516	B C 5L	C3080	B C 10D	CN5001	A D 1P	Q2055	B C 9L	R2201	B C 17L	R3222	B C 2E	R7143	B C 22B		
C517	A D 6L	C4001	A D 14F	CN7001	A D 1C	Q2201	B C 17I	R2202	B C 17L	R3223	B C 14B	R7151	B C 19P		
C518	A D 5K	C4002	B C 11F	CN7003	A D 5C	Q2202	B C 18I	R2203	B C 17L	R3224	B C 14B	R7152	B C 19O		
C519	B C 6K	C4003	B C 11F			Q2203	B C 18J	R2204	B C 17L	R3225	B C 18C	R7153	B C 20P		
C520	A D 5K	C4004	A D 14F	**DIODE**		Q2204	B C 18J	R2205	B C 17L	R3229	B C 13D	R7160	B C 20B		
C521	B C 7L	C4005	B C 13G	D3	A D 10M	Q2251	B C 15I	R2206	B C 17L	R3235	B C 18F	R7161	B C 19B		
C522	A D 8L	C4006	A D 13F	D4	A D 10M	Q2252	B C 15J	R2207	B C 16L	R3236	B C 17F	R7162	B C 19B		
C523	B C 8L	C4007	B C 12F	D201	A D 11F	Q2253	B C 15J	R2208	B C 16L	R3237	B C 10D	R7163	B C 21B		
C524	A D 8L	C4008	A D 13F	D501	A D 7N	Q2254	B C 15J	R2209	B C 18J	R3240	A D 7D				
C525	B C 8M	C4009	B C 11F	D502	A D 7O	Q2255	B C 15J	R2210	B C 18J	R3244	B C 17E	**OTHER**			
C527	A D 8M	C4010	B C 13G	D2001	A D 15N	Q3002	A D 4I	R2211	B C 18I	R3245	B C 8B	CP3001	A D 4F		
C528	B C 7M	C4011	B C 13F	D2251	A D 14J	Q3003	A D 19I	R2212	B C 17J	R3246	B C 15D	CP3002	B C 4F		
C529	B C 7N	C4012	A D 14F	D3001	A D 12H	Q3004	B C 4E	R2213	B C 17I	R3248	B C 15D	CP4001	A D 4G		
C530	B C 8N	C4014	B C 14F	D3002	A D 3D	Q3005	B C 2E	R2214	B C 17J	R3252	B C 7K	CP4002	B C 4G		
C532	B C 7M	C4015	B C 12F	D3003	A D 3E	G3901	B C 16B	R2215	A D 17I	R3253	A D 6K	J7101	A D 19Q		
C538	B C 6L	C4016	B C 14F	D3004	A D 2E	Q4001	B C 13G	R2216	B C 18J	R3254	B C 6I	J7102	A D 20Q		
C539	B C 7L	C4031	A D 6K	D3005	A D 2E	Q5101	A D 2L	R2217	B C 18J	R3255	A D 7C	J7103	A D 20O		
C540	B C 7N	C5001	A D 2P	D4001	B C 13F	Q5102	A D 3M	R2218	B C 18K	R4001	A D 15F	J7104	A D 13Q		
C541	B C 7O	C5002	A D 2N	D4002	A D 14F	Q5301	A D 4G	R2219	B C 18K	R4003	B C 12F	J7105	A D 20A		
C542	B C 7O	C5003	A D 3P	D5001	B C 2M	Q5303	A D 1F	R2220	B C 17I	R4004	B C 12F	J7106	A D 22A		
C550	B C 6P	C5004	A D 1J	D5101	A D 1M	Q5304	A D 3G	R2222	B C 16M	R4005	B C 13F	JS3001	A D 7G		
C551	B C 6P	C5006	A D 2M	D5102	A D 2K	Q5305	B C 3G	R2223	B C 16M	R4006	B C 12F	K2001	B C 14N		
C2001	A D 11N	C5101	A D 1M	D5103	A D 3K	Q5306	B C 3G	R2224	B C 15J	R4007	B C 11F	K2002	B C 14N		
C2002	A D 12N	C5102	A D 1K	D5105	A D 2K	Q5307	A D 2E	R2225	B C 15K	R4009	B C 13F	K2003	B C 9O		
C2003	A D 15N	C5103	B C 3L	D5203	A D 2I	Q5321	A D 1F	R2226	B C 17L	R4010	B C 14F	K2004	B C 9O		
C2004	B C 15N	C5104	A D 3M	D5204	A D 2I	Q6030	B C 21K	R2227	B C 17L	R4012	B C 13F	K2251	B C 15L		
C2005	A D 15N	C5105	B C 3K	D5206	A D 2H	Q7001	B C 10A	R2228	B C 17L	R4013	B C 13F	K2252	B C 16L		
C2006	B C 14N	C5106	B C 3K	D5207	A D 2I	Q7002	B C 10A	R2229	B C 17L	R4015	B C 14F	K2253	B C 15L		

■ 2D DIGITAL CIRCUIT BOARD

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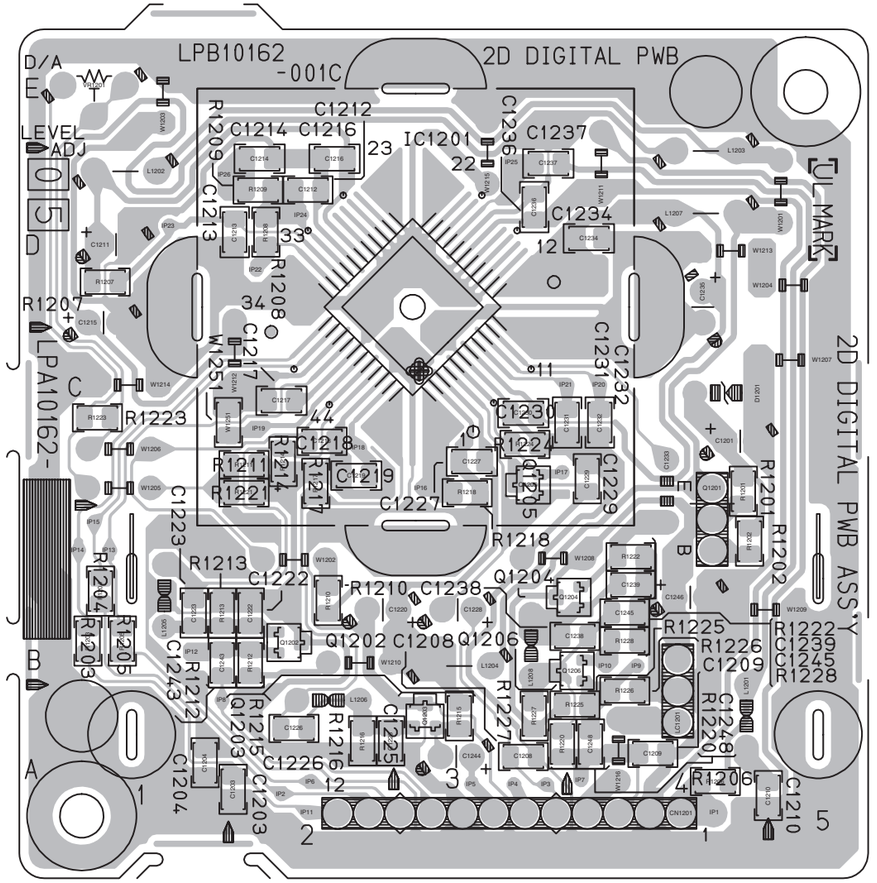

COMPONENT PARTS LOCATION GUIDE <2D DIGITAL> LPB10162-001C

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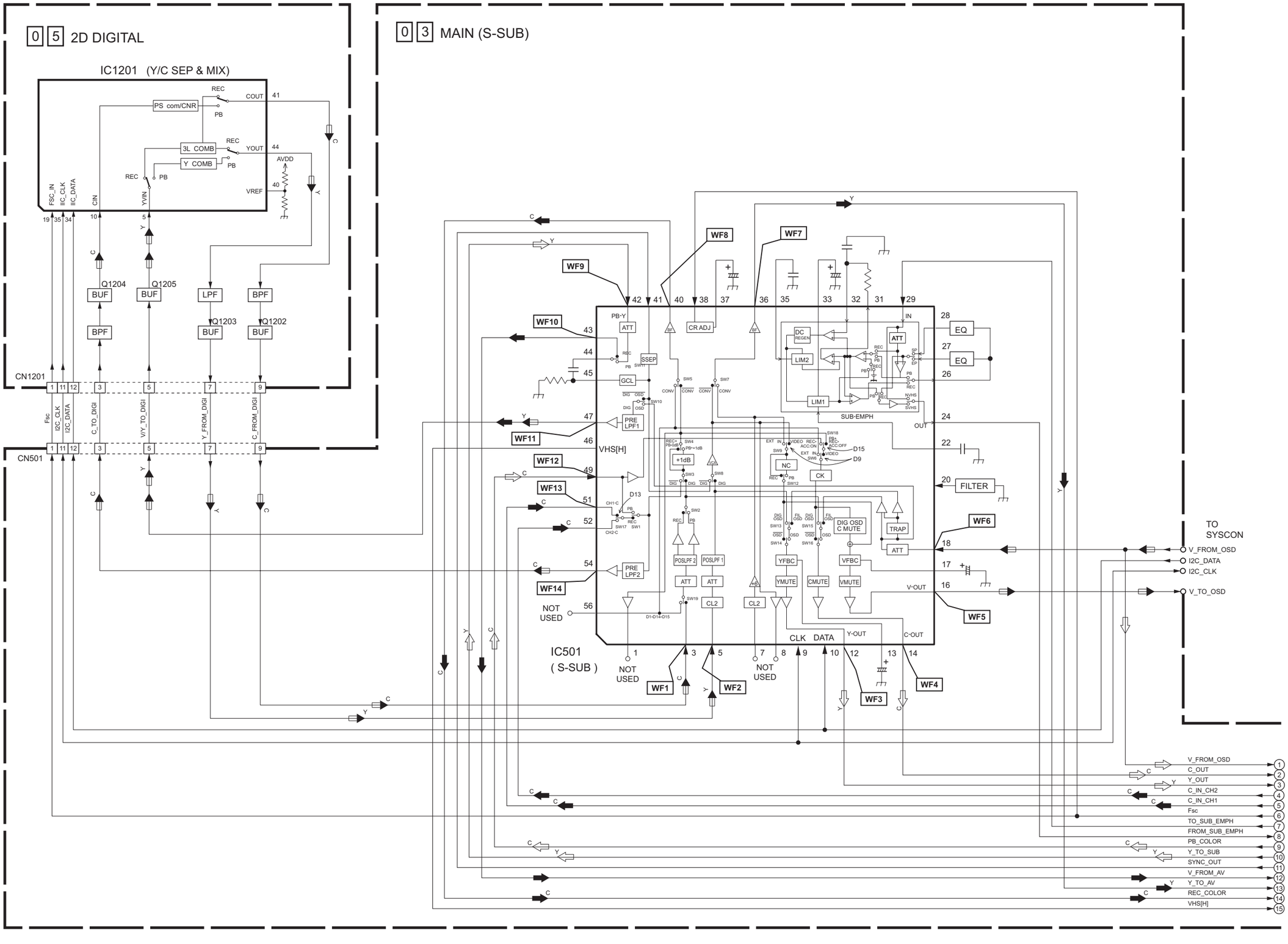
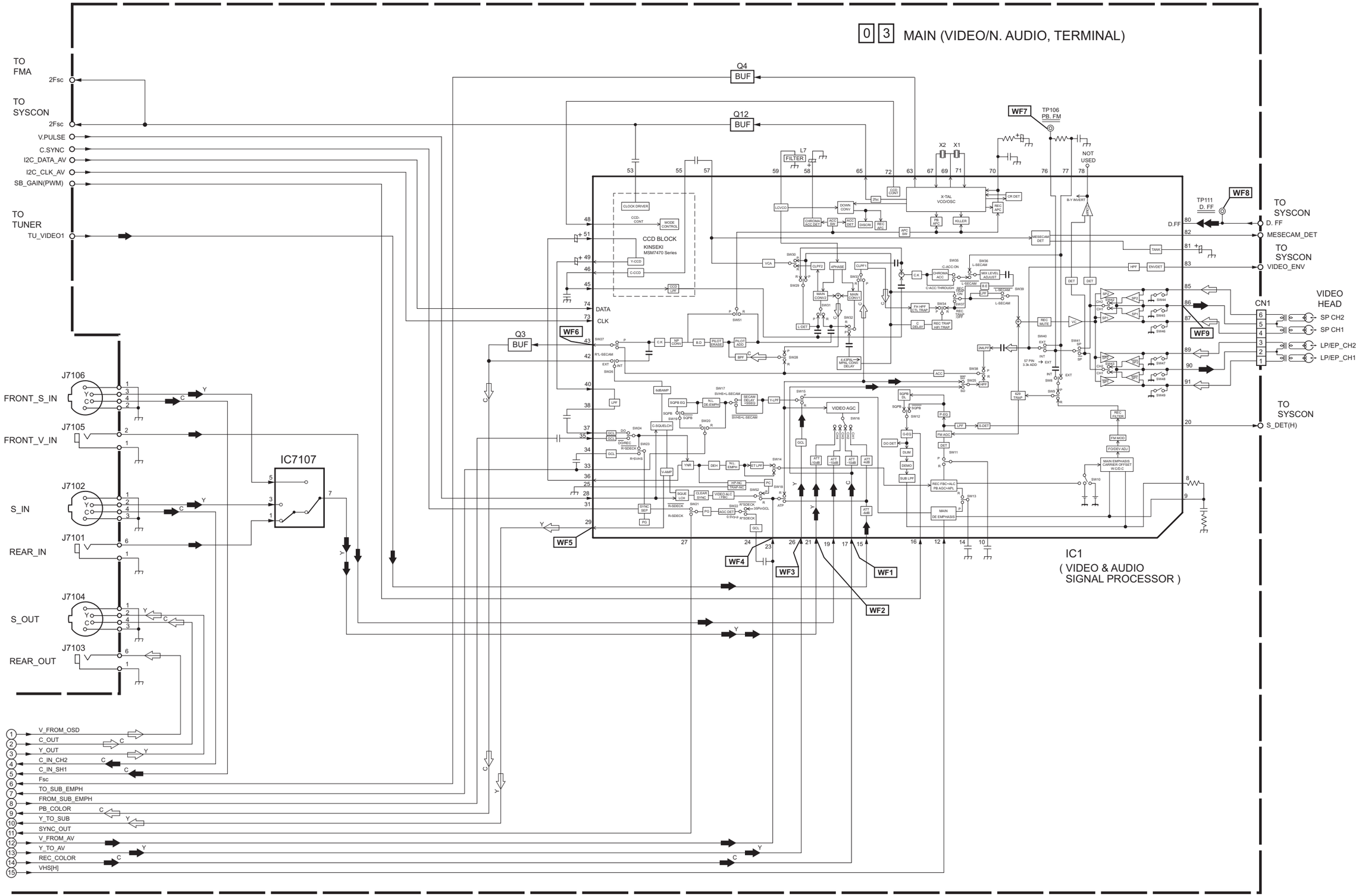
C1201	A D 4C	C1220	A D 3B	C1237	B C 3D	**IC**		Q1202	B C 2B	R1209	B C 2D	R1225	B C 3A
C1203	B C 2A	C1222	B C 2B	C1238	B C 3B	IC1201	B C 3D	Q1203	B C 3A	R1210	B C 2B	R1226	B C 4B
C1204	B C 1A	C1223	B C 1B	C1239	B C 4B			Q1204	B C 3B	R1211	B C 2C	R1227	B C 3A
C1208	B C 3A	C1225	B C 2A	C1243	B C 2B	**COIL**		Q1205	B C 3C	R1212	B C 2B	R1228	B C 4B
C1209	B C 4A	C1226	B C 2A	C1244	A D 3A	L1201	A D 4B	Q1206	B C 3B	R1213	B C 2B		
C1210	B C 5A	C1227	B C 3C	C1245	B C 4B	L1202	A D 1D			R1214	B C 2C	**OTHER**	
C1211	A D 1D	C1228	A D 3B	C1246	A D 4B	L1203	A D 4D	**RESISTOR**		R1215	B C 3A	LC1201	A D 4A
C1212	B C 2D	C1229	B C 4C	C1248	B C 4A	L1204	A D 3B	R1201	B C 4C	R1216	B C 2A	VR1201	A D 1E
C1213	B C 2D	C1230	B C 3C			L1205	A D 1B	R1202	B C 4B	R1217	B C 2C		
C1214	B C 2D	C1231	B C 3C	**CONNECTOR**		L1206	A D 2A	R1203	B C 1B	R1218	B C 3C		
C1215	A D 1C	C1232	B C 4C	CN1201	A D 4A	L1207	A D 4D	R1204	B C 1B	R1220	B C 3A		
C1216	B C 2D	C1233	A D 4C			L1208	A D 3B	R1205	B C 1B	R1221	B C 2C		
C1217	B C 2C	C1234	B C 4D	**DIODE**				R1206	B C 4A	R1222	B C 4B		
C1218	B C 2C	C1235	A D 4D	D1201	A D 4C	**TRANSISTOR**		R1207	B C 1D	R1223	B C 1C		

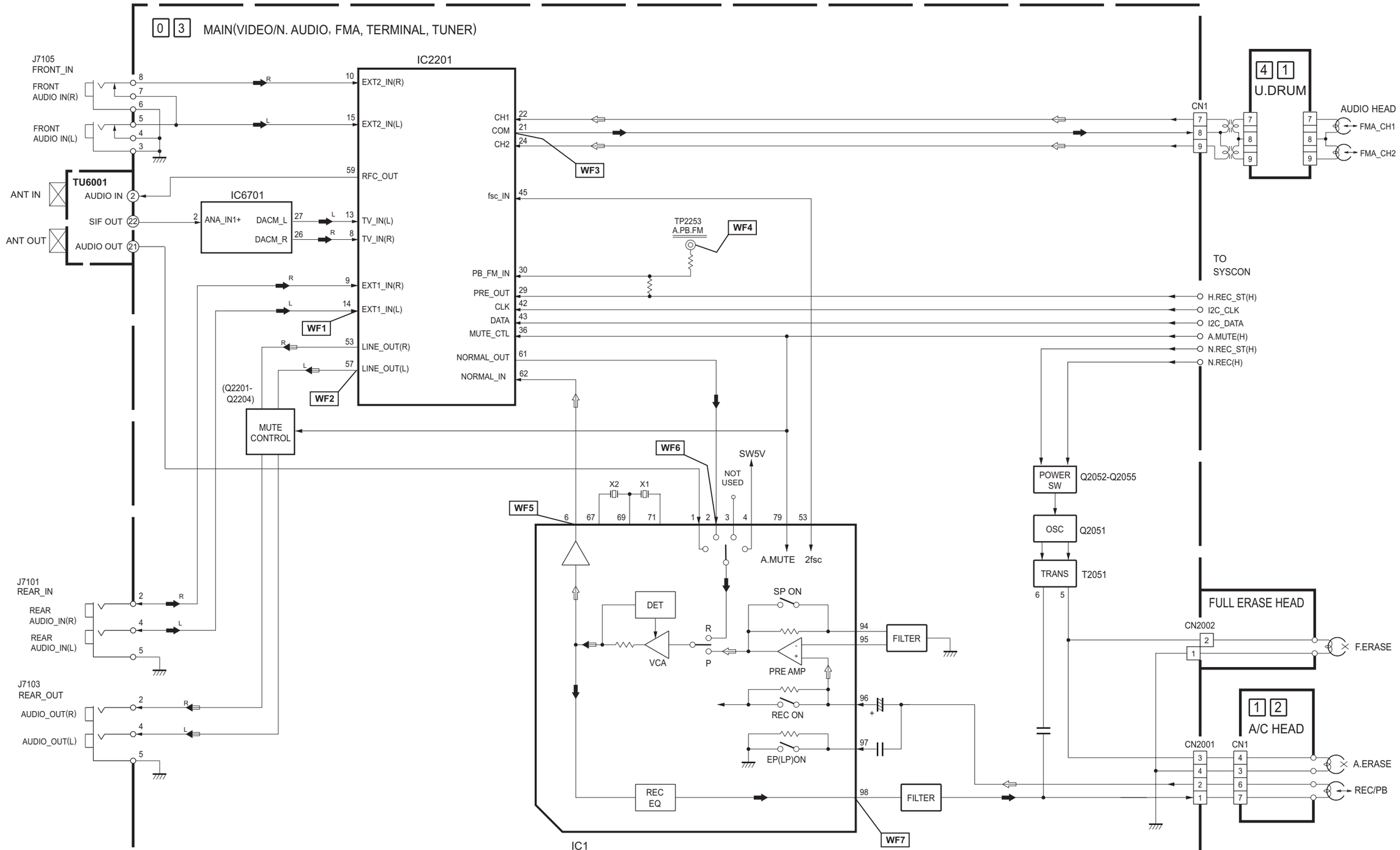
■ VIDEO BLOCK DIAGRAM (1)



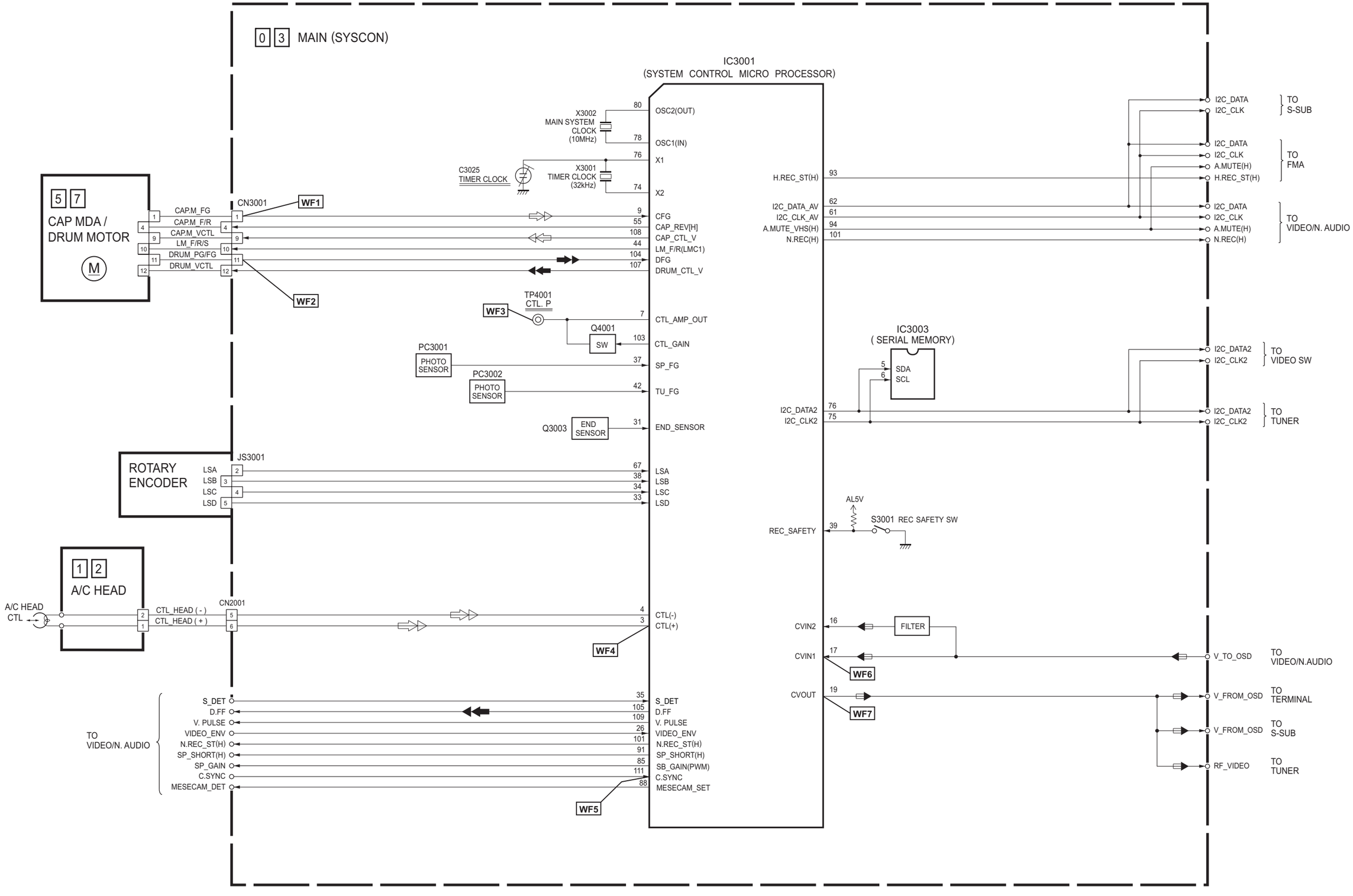
■ VIDEO BLOCK DIAGRAM (2)



■ AUDIO BLOCK DIAGRAM



■ SYSTEM CONTROL BLOCK DIAGRAM



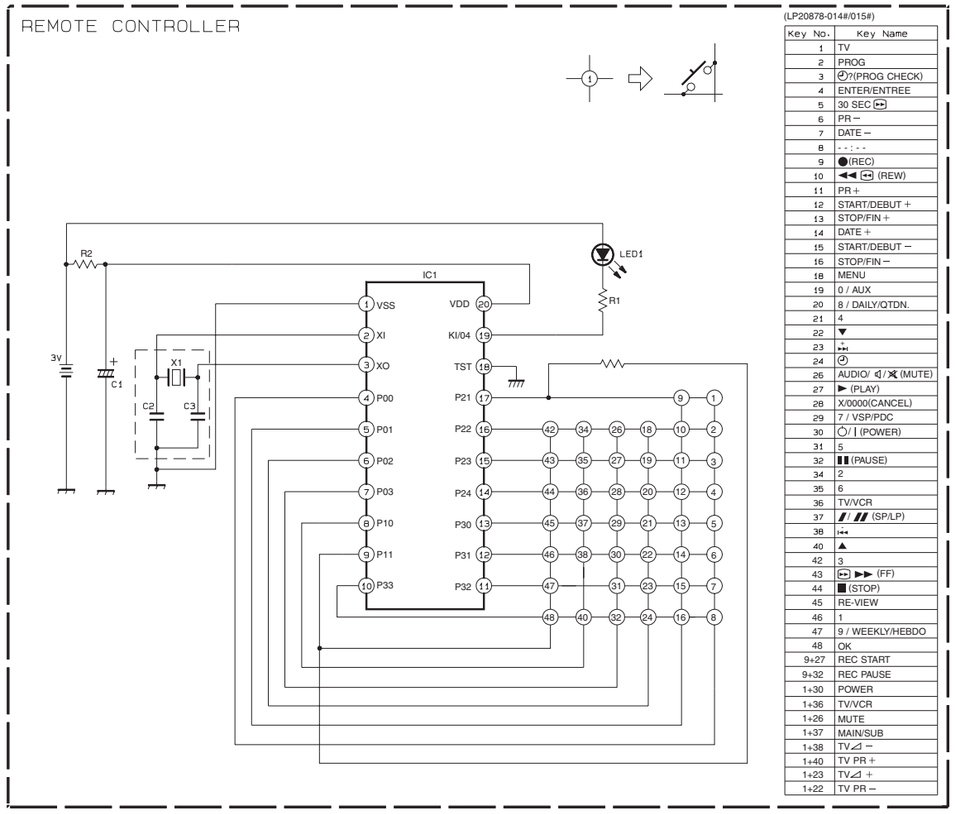
■ CPU PIN FUNCTION

<SYSCON IC3001>

PIN NO.	LABEL	IN/OUT	FUNCTION
1	SVss	-	GND
2	CTLREF	-	CTL REFERENCE VOLTAGE
3	CTL[+]	IN/OUT	CTL(+) SIGNAL
4	CTL[-]	IN/OUT	CTL(-) SIGNAL
5	CTLBIAS	-	CTL BIAS VOLTAGE
6	CTLFB	IN	CTL PULSE FEEDBACK
7	CTLAMPOUT	OUT	CTL PULSE OUTPUT
8	CTLSMTIN	IN	CTL PULSE OUTPUT
9	CFG	IN	CAPSTAN FG PULSE INPUT
10	SVcc	-	SYSTEM POWER
11	Avcc	-	SYSTEM POWER
12	AFCpc	OUT	AFC CLOCK (SYNC SEPARATOR FOR OSD / EXTERNAL CIRCUIT FOR AFC)
13	AFCosc	OUT	AFC CLOCK (SYNC SEPARATOR FOR OSD / EXTERNAL CIRCUIT FOR AFC)
14	CSYNC/HSYNC	IN	COMPOSITE SYNC/HORIZONTAL SYNC
15	VLPF/VSYNC	-	NOT USED
16	CVIN2	IN	COMPOSITE VIDEO SIGNAL INPUT(2)
17	CVIN1	IN	COMPOSITE VIDEO SIGNAL INPUT(1)
18	OVCC	-	SYSTEM POWER
19	CVOUT	OUT	COMPOSITE VIDEO SIGNAL OUTPUT
20	OVSS	-	GND
21	FSCOUT	OUT	FSC OUTPUT FOR OSD
22	FSCIN	IN	FSC INPUT FOR OSD
23	AVss	-	GND
24	AFC	IN	TUNING CHECK
25	RF_AGC	IN	CHANGES IN ATS+IC OUTPUT AS CAUSED BY CHANGES IN RECEIVER SENSITIVITY WHEN THE SAME CHANNEL IS RECEIVED MORE THAN ONCE ARE INPUT
26	VIDEO_ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
27	NC	-	NOT USED
28	KEY2	IN	OPERATION CONTROL SIGNAL
29	START_SENSOR	IN	START SENSOR/
30	KEY1	IN	OPERATION CONTROL SIGNAL
31	END_SENSOR	IN	END SENSOR
32	A.ENV/ND[L]	IN	AUDIO PB FM ENV.INPUT/NON HiFi MODE:L
33	LSD	IN	MECHANISM MODE DETECT (D)
34	LSC	IN	MECHANISM MODE DETECT (C)
35	S.DET	IN	DETECTION OF VIDEO SYNC SIGNAL (DETECTED:H)
36	AVcc	-	SYSTEM POWER
37	SP_FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
38	LSB	IN	MECHANISM MODE DETECT (B)
39	REC_SAFTY	IN	REC SAFETY SWITCH DETECT (SW ON:L)
40	S.CASS[H]	IN	DETECTION SIGNAL FOR SVHS CASSETTE (SVHS:H)
41	JSA	IN	INPUT FOR THE JOG SHUTTLE
42	TU_FG	IN	DETECTION SIGNAL TAKE-UP REEL ROTATION/TAPE REMAIN
43	DIG6	OUT	LED DRIVE
44	LM_FR(LMC1)	OUT	LOADING MOTOR DRIVE
45	NC	-	NOT USED
46	D_A	OUT	LED DRIVE
47	D_B	OUT	LED DRIVE
48	D_C	OUT	LED DRIVE
49	D_D	OUT	LED DRIVE
50	D_E	OUT	LED DRIVE
51	D_F	OUT	LED DRIVE
52	D_G	OUT	LED DRIVE
53	DIG7	OUT	LED DRIVE
54	P.CTL[H]	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY
55	CAP_REV[H]	OUT	CAPSTAN MOTOR REVERSE CONTROL (FWD:L/REV:H)
56	Vcc	-	SYSTEM POWER
57	Vss	-	GND
58	DIG5	OUT	LED DRIVE
59	I2C_CLK2	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC
60	I2C_DATA2	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR MEMORY IC
61	I2C_CLK	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC
62	I2C_DATA	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR MEMORY IC
63	DIG4	OUT	LED DRIVE
64	DIG3	OUT	LED DRIVE
65	DIG2	OUT	LED DRIVE
66	DIG1	OUT	LED DRIVE
67	LSA	IN	MECHANISM MODE DETECT (A)
68	NC	-	NOT USED
69	POWER_DET	IN	DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY
70	NC	-	NOT USED
71	PROTECT	IN	DETECTION SIGNAL FOR SW POWER SUPPLY
72	RC	IN	REMOTE CONTROL DATA INPUT
73	SW2	IN	TUNER SYSTEM MODE:L
74	FEW	OUT	FLASH WRITE ENABLE
75	X2	-	TIMER CLOCK(32kHz)
76	X1	-	TIMER CLOCK(32kHz)
77	RES	-	RESET TERMINAL(RESET ON:L)
78	OSC1(IN)	-	MAIN SYSTEM CLOCK(10MHz)
79	Vss	-	GND
80	OSC2(OUT)	-	MAIN SYSTEM CLOCK(10MHz)
81	VCL	-	SYSTEM POWER
82	MODE	-	NOT USED
83	CTL_B	OUT	INPUT VIDEO SIGNAL SELECT CONTROL-B
84	ET_REC[H]	OUT	S-VHS ET REC MODE:H
85	SB_GAIN	OUT	VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE
86	CTL_A	OUT	INPUT VIDEO SIGNAL SELECT CONTROL-A
87	NC	-	NOT USED
88	MESECAM_DET	OUT	MESECAM:H
89	JSB	IN	INPUT FOR THE JOG SHUTTLE
90	NC	-	NOT USED
91	SP_SHORT[H]	OUT	MODE SELECT
92	LP/EP_SHORT[H]	OUT	MODE SELECT
93	H.REC_ST[H]	OUT	HiFi AUDIO SOUND RECORDING START
94	A.MUTE[H]	OUT	AUDIO MUTE CONTROL (MUTE:H)
95	PAL_PB[H]	OUT	PAL FM (PB ON:H)
96	YCO	OUT	OSD CHARACTER SIGNAL
97	NC	-	NOT USED
98	P.MUTE[L]	OUT	PICTURE MUTE CONTROL (MUTE ON : L)
99	R	-	NOT USED
100	N.REC_ST[H]	OUT	NORMAL AUDIO SOUND RECORDING START
101	N_REC[H]	OUT	NORMAL AUDIO REC MODE CONTROL SIGNAL (REC:H)
102	SW1	OUT	TUNER SYSTEM MODE:H
103	CTL_GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
104	DFG	IN	DRUM FG PULSE INPUT
105	D.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
106	A.FF	OUT	AUDIO FF OUTPUT
107	DRUM_CTL_V	OUT	DRUM MOTOR CONTROL
108	CAP_CTL_V	OUT	CAPSTAN MOTOR CONTROL
109	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
110	Vss	-	GND
111	C.SYNC	IN	COMPOSITE SYNC INPUT
112	Vcc	-	SYSTEM POWER

■ REMOTE CONTROLLER SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.

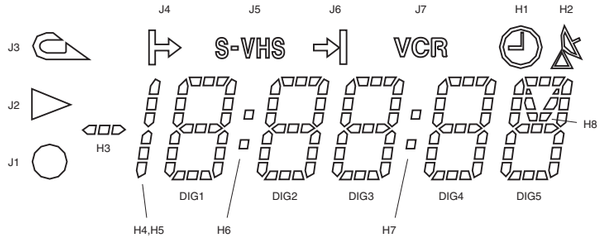


(LP20878-014#/015#)

Key No.	Key Name
1	TV
2	PROG
3	?(PROG CHECK)
4	ENTER/ENTREE
5	30 SEC
6	PR –
7	DATE –
8	- - : - -
9	●(REC)
10	◄◄ (REW)
11	PR +
12	START/DEBUT +
13	STOP/FIN +
14	DATE +
15	START/DEBUT –
16	STOP/FIN –
18	MENU
19	0 / AUX
20	8 / DAILY/QTDN.
21	4
22	▼
23	▶▶|
24	
26	AUDIO/ / (MUTE)
27	▶ (PLAY)
28	X/0000(CANCEL)
29	7 / VSP/PDC
30	/ I (POWER)
31	5
32	▮▮ (PAUSE)
34	2
35	6
36	TV/VCR
37	/ (SP/LP)
38	|◄◄
40	▲
42	3
43	►► (FF)
44	■ (STOP)
45	RE-VIEW
46	1
47	9 / WEEKLY/HEBDO
48	OK
9+27	REC START
9+32	REC PAUSE
1+30	POWER
1+36	TV/VCR
1+26	MUTE
1+37	MAIN/SUB
1+38	TV –
1+40	TV PR +
1+23	TV +
1+22	TV PR –

■ FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT



ANODE CONNECTION

No.	CONNECTION
1	CATHODE G, J7, H8
2	CATHODE F, J6, H7
3	CATHODE E, J5, H6
4	CATHODE D, J4, H4, H5
5	CATHODE C, J3, H3
6	CATHODE B, J2, H2
7	CATHODE A, J1, H1
8	COMMON ANODE H1-H8
9	COMMON ANODE J1-J7
10	COMMON ANODE (DIGIT 5)
11	COMMON ANODE (DIGIT 4)
12	COMMON ANODE (DIGIT 3)
13	COMMON ANODE (DIGIT 2)
14	COMMON ANODE (DIGIT 1)

■ VOLTAGE CHARTS

<VIDEO/N.AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	0	0
2	0	0
3	0	0
4	5.1	5.0
5	2.0	2.0
6	2.5	0
7	2.8	2.8
8	1.8	1.5
9	1.8	1.4
10	2.0	1.6
11	2.5	1.9
12	1.6	0.7
13	0	0
14	2.7	2.5
15	2.8	2.7
16	0	2.6
17	2.7	2.8
18	1.98	1.8
19	2.8	2.7
20	0	4.1
21	2.8	0
22	5.1	5.0
23	2.3	2.2
24	3.1	2.8
25	0	0
26	1.5	2.7
27	1.5	1.5
28	0	0
29	1.9	2.4
30	2.9	2.9
31	0.2	0.3
32	2.2	2.3
33	2.0	2.0
34	3.0	3.0
35	2.9	3.0
36	2.3	2.3
37	3.0	3.0
38	2.1	2.1
39	1.4	1.4
40	2.0	2.1
41	2.7	2.5
42	1.9	1.9
43	2.1	2.1
44	0	0
45	3.1	3.1
46	3.1	3.1
47	5.1	5.0
48	0	0
49	3.1	3.2
50	5.1	5.0
51	2.0	2.0
52	0	5.0
53	2.6	2.6
54	0	0
55	2.0	2.0
56	0	0
57	2.2	2.1
58	2.3	2.3
59	5.0	5.0
60	5.0	5.0
61	0	0
62	2.2	0
63	2.1	2.1
64	2.5	2.5
65	2.3	2.2
66	2.5	2.5
67	0.3	0.6
68	1.3	1.2
69	2.0	1.9
70	2.7	1.0
71	0.1	2.1
72	0	0
73	4.6	4.6
74	4.6	0
75	2.7	2.6
76	2.2	2.2
77	2.8	0
78	0	0
79	0.5	2.5
80	0	2.5
81	5.0	4.8
82	0	0
83	0	1.2
84	5.1	5.0
85	2.4	2.2
86	2.5	2.2
87	2.4	2.2
88	0	0
89	0	0
90	0	0
91	0	0
92	5.1	5.0
93	1.5	0.2
94	2.5	2.5
95	2.5	2.5
96	2.5	2.5

MODE PIN NO.	REC	PLAY
97	0	0
98	2.3	0
99	0	0
100	2.6	2.5
Q1		
E	0	0
C	0.5	0.6
B	0	0
Q4		
E	2.8	2.8
C	0	0
B	2.1	2.1
Q7		
E	2.5	2.2
C	2.5	2.2
B	0	0
Q8		
E	2.5	2.2
C	2.5	2.1
B	0	0
Q9		
E	0	0
C	0	0
B	0.7	0.7
Q10		
E	0	0
C	0	0
B	0.7	0.7
Q12		
E	2.9	2.9
C	0	0
B	2.3	2.3
Q2001		
E	-9.9	0
C	0	0
B	-16.2	0.6
Q2002		
E	-9.9	0
C	0	0
B	-16.0	0.6
Q2003		
E	5.1	5.0
C	-16.1	4.9
B	4.9	0
Q2051		
E	0	0
C	7.4	0.1
B	0.4	0
Q2052		
E	10.6	10.6
C	10.4	1.1
B	9.9	10.6
Q2053		
E	0	0
C	0	10.5
B	4.9	0
Q2054		
E	10.4	1.1
C	10.2	0
B	9.7	1.0
Q2055		
E	0	0
C	0	0.9
B	4.8	0
CN1		
1	0	0
2	0	0
3	0	0
4	2.5	2.2
5	2.5	2.2
6	2.4	2.2
7	2.5	0
8	2.6	0
9	2.5	0
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.2	2.4
6	2.4	2.5
CN2002		
1	0	0
2	0	0

<SYSCON>

MODE PIN NO.	REC	PLAY
IC3001		
1	0	0
2	2.3	2.4
3	2.9	2.5
4	1.6	2.5
5	2.5	2.4
6	0.4	0.9
7	2.5	2.4
8	2.4	2.4
9	1.4	
10	4.9	4.9
11	1.8	1.6
12	1.8	1.8
13	2.4	2.4
14	0.4	0.4
15	0.8	0.9
16	2.9	0
17	2.5	2.5
18	5.1	5.0
19	2.6	2.5
20	0	0
21	0	0
22	2.5	2.4
23	0	0
24	2.2	0
25	0.4	1.0
26	0	1.2
27	0.4	0.9
28	4.9	4.9
29	0	0
30	4.9	4.9
31	4.8	4.8
32	4.3	0
33	4.9	4.9
34	0	0
35	0	4.1
36	4.9	0
37	-	4.9
38	4.9	4.9
39	4.9	4.9
40	4.1	4.1
41	0	4.8
42	-	-
43	4.9	4.7
44	2.5	2.4
45	0	0
46	3.4	2.0
47	3.5	2.8
48	2.8	3.4
49	2.1	2.7
50	4.1	3.4
51	2.0	3.4
52	2.1	2.7
53	4.7	4.7
54	4.8	4.8
55	0	0
56	4.9	4.8
57	0	0
58	4.8	4.7
59	4.9	4.3
60	4.9	4.1
61	4.6	4.5
62	4.6	4.6
63	4.8	0
64	4.8	4.7
65	4.8	4.8
66	4.8	4.7
67	0	0
68	0	0
69	0	0
70	0	0
71	4.3	4.3
72	4.8	4.8
73	0	4.5
74	0	0
75	1.4	1.5
76	1.2	1.0
77	4.9	4.9
78	2.4	2.4
79	0	00
80	2.4	2.4
81	3.2	3.1
82	4.9	4.9
83	0	0
84	0	0
85	0	0
86	0	0
87	0	0
88	0	0
89	0	0
90	0	0
91	0	0
92	4.7	4.7
93	4.7	0
94	0	0
95	4.8	4.8
96	0	0

MODE PIN NO.	REC	PLAY
97	0	0
98	4.9	4.8
99	0	0
100	4.8	0
101	4.8	0
102	4.2	4.5
103	4.8	4.8
104	1.2	1.3
105	2.5	2.2
106	0	2.7
107	0	2.3
108	2.6	2.5
109	0	0
110	0	0
111	0	0.3
112	4.9	4.8
IC3002		
1	4.9	4.9
2	4.9	4.8
3	0	0
4	0	0
IC3003		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.8	4.2
6	4.9	4.3
7	0	0
8	4.9	4.8
Q201		
E	3.2	3.1
C	0	0
B	2.5	2.5
Q202		
E	2.5	2.4
C	5.1	5.1
B	3.1	3.1
Q3003		
E	0	0
C	4.9	4.8
B	-	-
Q3004		
E	0	0
C	0	0
B	0.7	0.7
Q3005		
E	5.0	4.9
C	5.7	5.6
B	5.6	5.5
Q4001		
E	0	0
C	0	0
B	4.8	4.8
CN3001		
1	2.3	2.3
2	11.8	11.9
3	5.1	5.1
4	0	0
5	10.0	10.1
6	0	0
7	0	0
8	11.8	11.9
9	2.6	2.5
10	2.5	2.4
11	0	1.3
12	2.5	2.5
JS3001		
1	0	0
2	0	0
3	4.9	4.8
4	0	0
5	5.0	4.9

<S-SUB>

MODE PIN NO.	REC	PLAY
IC501		
1	0.3	2.9
2	5.1	5.0
3	2.8	2.8
4	4.9	4.8
5	3.3	3.3
6	5.1	5.0
7	2.8	0
8	0.3	0
9	4.7	4.6
10	0.7	4.6
11	5.1	5.0
12	2.3	2.3
13	2.8	0
14	2.4	2.4
15	0	0
16	2.4	2.3
17	0	2.8
18	2.5	2.4
19	0	0
20	3.2	2.1
21	0	0
22	0	0
23	0	0
24	0	2.4
25	0	0
26	2.4	2.4
27	2.4	2.3
28	0.1	2.3
29	0	2.4
30	3.7	3.6
31	2.4	2.4
32	2.3	2.4
33	3.5	3.4
34	5.0	5.0
35	0	0
36	2.4	2.1
37	2.6	2.6
38	2.8	2.8
39	2.8	2.8
40	3.0	2.8
41	1.5	1.6
42	1.9	0
43	2.3	2.3
44	2.4	2.6
45	3.1	3.1
46	0	0
47	2.3	2.3
48	0	0
49	2.9	0
50	4.4	4.3
51	2.9	0
52	2.8	2.8
53	0	0
54	0.5	2.5
55	4.4	4.3
56	2.9	2.8

<FMA>

MODE PIN NO.	REC	PLAY
IC2201		
1	2.4	2.3
2	0	0
3	2.4	2.4
4	0	0
5	0	0
6	2.5	2.4
7	2.0	2.1
8	0	0
9	0	0
10	0	0
11	0	0
12	1.9	2.1
13	0	0
14	0	0
15	0	0
16	2.5	2.4
17	0.7	0.3
18	2.6	2.5
19	2.5	2.4
20	2.6	0
21	2.5	0
22	2.6	0.7
23	0	0
24	2.6	0.6
25	5.0	5.0
26	2.6	0
27	0	2.6
28	4.3	0
29	4.1	1.8
30	3.9	1.7
31	1.0	2.9
32	2.5	2.5
33	2.5	2.5
34	0.7	0.3
35	2.5	2.4
36	0	0
37	0	1.6
38	0	0
39	0	0
40	5.0	5.0
41	0	0
42	4.7	4.6
43	0	4.6
44	3.2	3.3
45	0	0
46	5.0	4.8
47	2.5	2.5
48	2.5	2.5
49	0.3	0.3
50	0.5	0.2
51	0	0
52	0	0
53	4.5	4.5
54	0	0
55	0	0
56	0	0
57	4.4	4.5
58	8.4	8.5
59	4.6	0
60	1.1	0
61	2.5	2.5
62	2.4	0
63	4.6	4.5
64	4.7	4.6
Q2201		
E	4.9	4.9
C	-0.5	-0.7
B	4.9	4.8
Q2202		
E	0	0
C	4.9	4.8
B	0	0
Q2203		
E	0	0
C	0	0
B	-0.6	-0.6
Q2204		
E	0	0
C	0	0
B	-0.6	-0.5
Q2251		
E	0	0
C	0	0
B	4.1	4.1
Q2252		
E	0	0
C	0	0
B	0	0
Q2253		
E	0	0
C	0.1	0.2
B	0.1	0
Q2254		
E	0	0
C	0.1	0.2
B	0..1	0

MODE PIN NO.	REC	PLAY
Q2255		
E	0	0
C	0	0
B	4.8	4.8

<SWITCHING REGULATOR>

MODE PIN NO.	REC	PLAY
Q5101		
S	0	0
D	300.8	124.9
G	3.1	4.5
Q5102		
E	0	0
C	3.1	4.5
B	0.1	0.3
Q5301		
E	0	0
C	4.5	4.4
B	0.4	0.5
Q5303		
E	5.2	5.1
C	5.7	5.6
B	5.9	5.8
Q5304		
E	10.6	10.6
C	11.9	12.0
B	11.2	11.2
Q5305		
E	11.3	11.2
C	11.2	11.2
B	0	-0.1
Q5306		
E	0	0
C	0	0
B	4.5	4.4
Q5307		
E	5.0	4.9
C	5.7	5.5
B	5.7	5.6

<TUNER/DEMOD>

MODE PIN NO.	REC	PLAY
IC6701		
1	5.0	4.9
2	1.5	1.5
3	1.5	1.2
4	0	0
5	2.4	2.4
6	2.3	2.2
7	0	0.4
8	0	0
9	0	0
10	0	3.5
11	3.2	3.5
12	4.9	4.4
13	4.9	4.2
14	0.1	0.4
15	0.1	0.4
16	0.1	0.4
17	0.2	0.5
18	0.1	0.5
19	0	4.9
20	0	0
21	0.1	0.5
22	4.4	4.2
23	0	0
24	0	0
25	0	0
26	1.0	0
27	1.0	0
28	0	0
29	0	0
30	0	2.3
31	2.3	2.3
32	0	0
33	4.6	4.6
34	3.1	3.7
35	0	0
36	2.3	2.3
37	0	0
38	0	0
39	0	0
40	2.3	2.3
41	2.3	2.3
42	0	2.6
43	2.3	2.3
44	0	0
Q6030		
E	4.5	2.5
C	0	0
B	3.8	1.9
TU6001		
1	4.9	4.9
2	0	0
3	4.9	14.3
4	4.9	4.9
5	5.0	4.3
6	2.2	2.2
7	-	0
8	2.3	1.7
9	-	3.8
10	0	0
11	4.9	4.3
12	0	4.2
13	-	0
14	5.0	4.9
15	0	0
16	0	31.8
17	0	0
18	0	0
19	4.1	4.5
20	0.1	4.5
21	2.1	2.1
22	0	0
23	2.41	2.2
24	3.8	1.9
25	5.0	5.0

<FRONT>

MODE PIN NO.	REC	PLAY
IC7002		
1	4.9	4.8
2	4.9	4.9
3	0	0
Q7001		
E	4.9	4.9
C	0.9	0.8
B	4.8	4.7
Q7002		
E	4.9	4.9
C	0.8	0.9
B	4.8	4.7
Q7003		
E	4.9	4.8
C	0.8	0.8
B	4.8	4.7
Q7004		
E	4.9	4.9
C	0.8	0.9
B	4.8	4.7
Q7005		
E	4.9	4.9
C	0.8	0.8
B	4.8	4.7
Q7006		
E	4.9	4.9
C	0.8	0.8
B	4.8	4.7
Q7007		
E	4.9	4.9
C	1.1	1.1
B	4.8	4.7
Q7008		
E	0	0
C	1.3	0.9
B	3.4	2.1
Q7009		
E	0	0
C	0.9	0.9
B	2.9	4.1
Q7010		
E	0	0
C	0.9	1.3
B	2.8	2.7
Q7011		
E	0	0
C	2.2	0.9
B	2.0	2.7
Q7012		
E	0	0
C	1.3	0.8
B	2.0	2.7
Q7013		
E	0	0
C	1.7	1.1
B	1.4	3.4
Q7014		
E	0	0
C	2.6	1.2
B	1.4	2.0
CN7001		
1	0	4.9
2	0.1	4.9
3	0	0
4	5.0	4.9

<TERMINAL>

MODE PIN NO.	REC	PLAY
IC7107		
1	1.5	1.4
2	0	.0
3	1.6	1.5
4	0	0
5	1.6	1.6
6	5.1	5.0
7	0	0.7
8	0	0
Q7104		
E	3.2	3.1
C	0	0
B	2.4	2.4
Q7106		
E	3.0	3.0
C	0	0
B	0	2.3
Q7107		
E	3.1	3.1
C	0	0
B	2.5	2.4

<ADV.JOG>

MODE PIN NO.	REC	PLAY
CN7003		
1	0	4.9
2	0.1	4.9
3	0	0
4	5.0	4.9

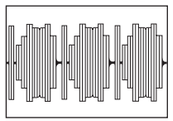
<2D DIGITAL>

MODE PIN NO.	REC	PLAY
IC1201	-	-
Q1201		
E	3.5	3.5
C	4.8	4.8
B	4.2	4.2
Q1202		
E	1.0	1.0
C	0	0
B	0.2	0.3
Q1203		
E	1.0	1.0
C	0	0
B	0.4	0.4
Q1204		
E	0	1.8
C	4.8	4.8
B	0.4	2.4
Q1205	-	-
CN1201		
1	2.8	2.7
2	0.1	0
3	0.5	2.3
4	5.1	5.0
5	2.1	2.3
6	0	0
7	3.2	3.3
8	0.1	0
9	2.8	2.7
10	0	0
11	4.6	4.6
12	4.6	4.6

■ WAVEFORMS

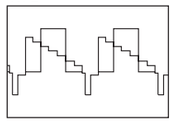
<VIDEO(1)>

WF1 IC501-3



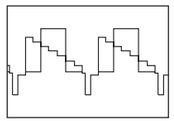
REC0.5Vp-p/PB 0.6Vp-p
0.2V/20µsec/DIV

WF2 IC501-5



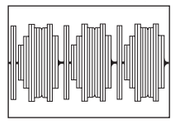
REC/PB 0.7Vp-p
0.2V/20µsec/DIV

WF3 IC501-12



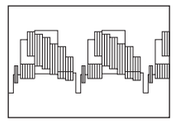
REC/PB 2.0Vp-p
0.5V/20µsec/DIV

WF4 IC501-14



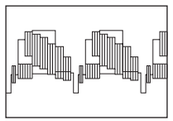
REC/PB 1.0Vp-p
0.5V/20µsec/DIV

WF5 IC501-16



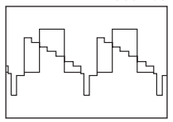
REC/PB 2.2Vp-p
1.0V/20µsec/DIV

WF6 IC501-18



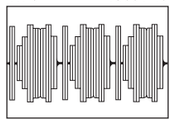
REC/PB 2.2Vp-p
1.0V/20µsec/DIV

WF7 IC501-36



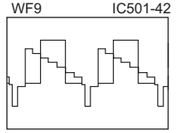
REC 0.5Vp-p
0.2V/20µsec/DIV

WF8 IC501-40



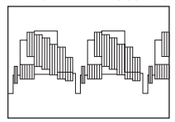
REC 0.5Vp-p
0.2V/20µsec/DIV

WF9 IC501-42



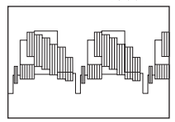
PB 2.0Vp-p
1.0V/20µsec/DIV

WF10 IC501-43



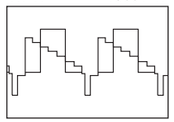
REC 0.6Vp-p
0.2V/20µsec/DIV

WF11 IC501-47



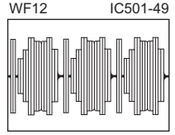
REC 1.8Vp-p
1.0V/20µsec/DIV

WF11 IC501-47



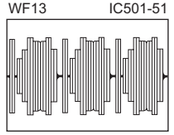
PB 1.5Vp-p
1.0V/20µsec/DIV

WF12 IC501-49



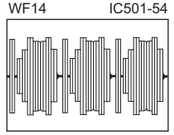
PB 0.6Vp-p
0.2V/20µsec/DIV

WF13 IC501-51



REC 0.7Vp-p
0.2V/20µsec/DIV

WF14 IC501-54



REC0.7Vp-p/PB 1.5Vp-p
0.5V/20µsec/DIV

<VIDEO(2)>

WF1 IC1-17

REC 0.5Vp-p
0.2V/20µsec/DIV

WF2 IC1-21

REC 1.0Vp-p
0.5V/20µsec/DIV

WF3 IC1-26

REC 0.5Vp-p
0.2V/20µsec/DIV

WF4 IC1-23

REC 0.5Vp-p
0.2V/20µsec/DIV

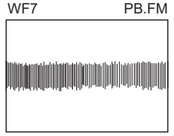
WF5 IC1-29

PB 2.0Vp-p
1.0V/20µsec/DIV

WF6 IC-43

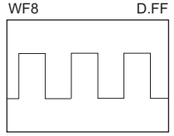
PB 0.6Vp-p
0.5V/20µsec/DIV

WF7 TP106 PB.FM



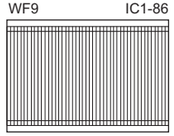
PB 0.3Vp-p
0.1V/1msec/DIV

WF8 TP111 D.FF



REC/PB 4.0Vp-p
1.0V/10msec/DIV

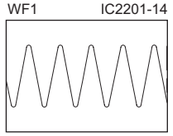
WF9 IC1-86



REC 2.4Vp-p
1.0V/20µsec/DIV

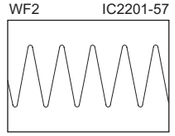
<AUDIO>

WF1 IC2201-14



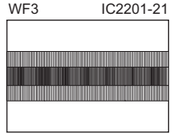
REC/PB 30mVp-p
10mV/0.5msec/DIV

WF2 IC2201-57



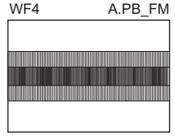
REC/PB 0.3Vp-p
0.1V/0.5msec/DIV

WF3 IC2201-21



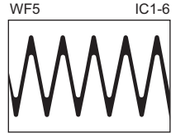
REC 1.0Vp-p
20mV/20µsec/DIV

WF4 TP2253 A.PB_FM



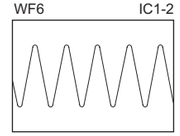
PB 0.7Vp-p
20mV/5µsec/DIV

WF5 IC1-6



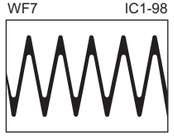
REC/PB 0.3Vp-p
0.1V/0.5msec/DIV

WF6 IC1-2



REC/PB 25mVp-p
10mV/0.5msec/DIV

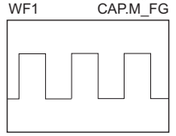
WF7 IC1-98



REC 0.5Vp-p
0.1V/1msec/DIV

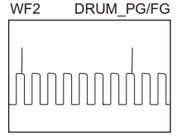
<SYSTEM CONTROL>

WF1 CN3001-1 CAP.M_FG



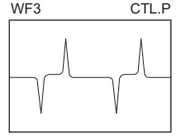
REC/PB 4.5Vp-p
2.0V/0.5msec/DIV

WF2 CN3001-11 DRUM_PG/FG



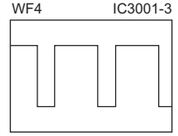
REC/PB 4.8Vp-p
1.0V/2msec/DIV

WF3 TP4001 CTL.P



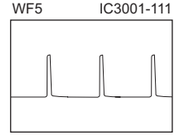
PB 2.4Vp-p
1.0V/5msec/DIV

WF4 IC3001-3



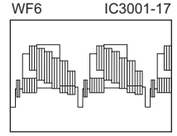
REC 4.2Vp-p
1.0V/5msec/DIV

WF5 IC3001-111



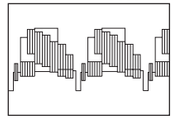
REC 5.0Vp-p
1.0V/20µsec/DIV

WF6 IC3001-17



REC/PB 2.2Vp-p
1.0V/20µsec/DIV

WF6 IC3001-19



REC/PB 2.2Vp-p
1.0V/20µsec/DIV

JVC
Victor Company of Japan, Limited
AV & MULTIMEDIA COMPANY DIGITAL VIDEO STORAGE CATEGORY 12, 3-chome, Moriya-cho, kanagawa-ku, Yokohama, kanagawa-prefecture, 221-8528, Japan

(No.YD047)

Printed in Japan
VPT

PARTS LIST

[HR-S6970AA,HR-S6970AG, HR-S6970AH,HR-S6970AJ]

* SAFETY PRECAUTION
  Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.
* BEWARE OF BOGUS PARTS
  Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.
* (x_) in a description column shows the number of the used part.

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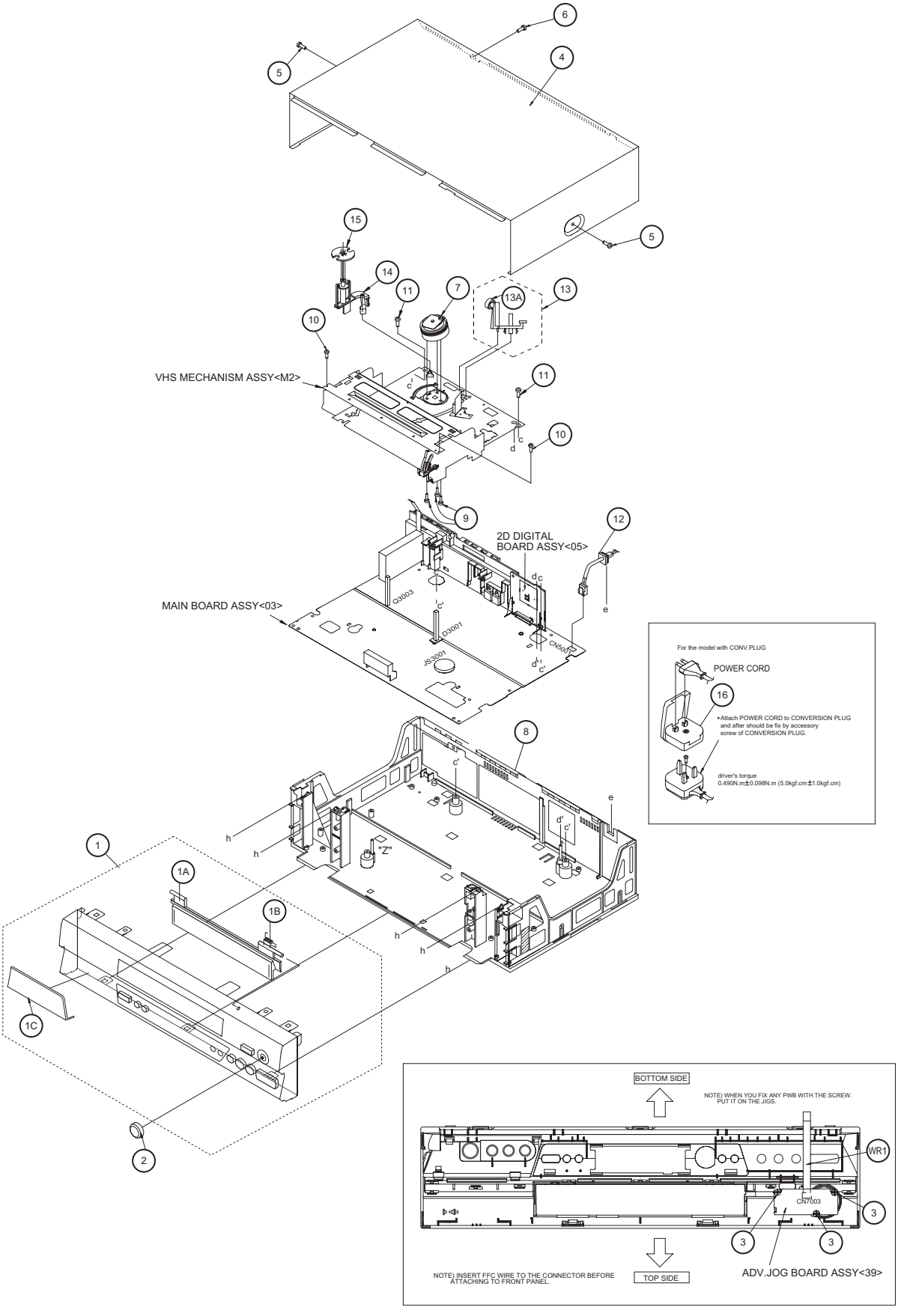
VHS mechanism assembly and parts list.....3-4
Electrical parts list 3-7
Packing materials and accessories parts list 3-14

Exploded view of general assembly and parts list

Block No. M1MM


VHS MECHANISM ASSY<M2>
2D DIGITAL
BOARD ASSY<05>
MAIN BOARD ASSY<03>
"Z"
For the model with CONV.PLUG
POWER CORD
•Attach POWER CORD to CONVERSION PLUG and after should be fix by accessory screw of CONVERSION PLUG.
driver's torque
0.490N.m±0.098N.m (5.0kgf.cm±1.0kgf.cm)
BOTTOM SIDE
NOTE) WHEN YOU FIX ANY PWB WITH THE SCREW. PUT IT ON THE JIGS.
TOP SIDE
NOTE) INSERT FFC WIRE TO THE CONNECTOR BEFORE ATTACHING TO FRONT PANEL.
ADV.JOG BOARD ASSY<39>

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

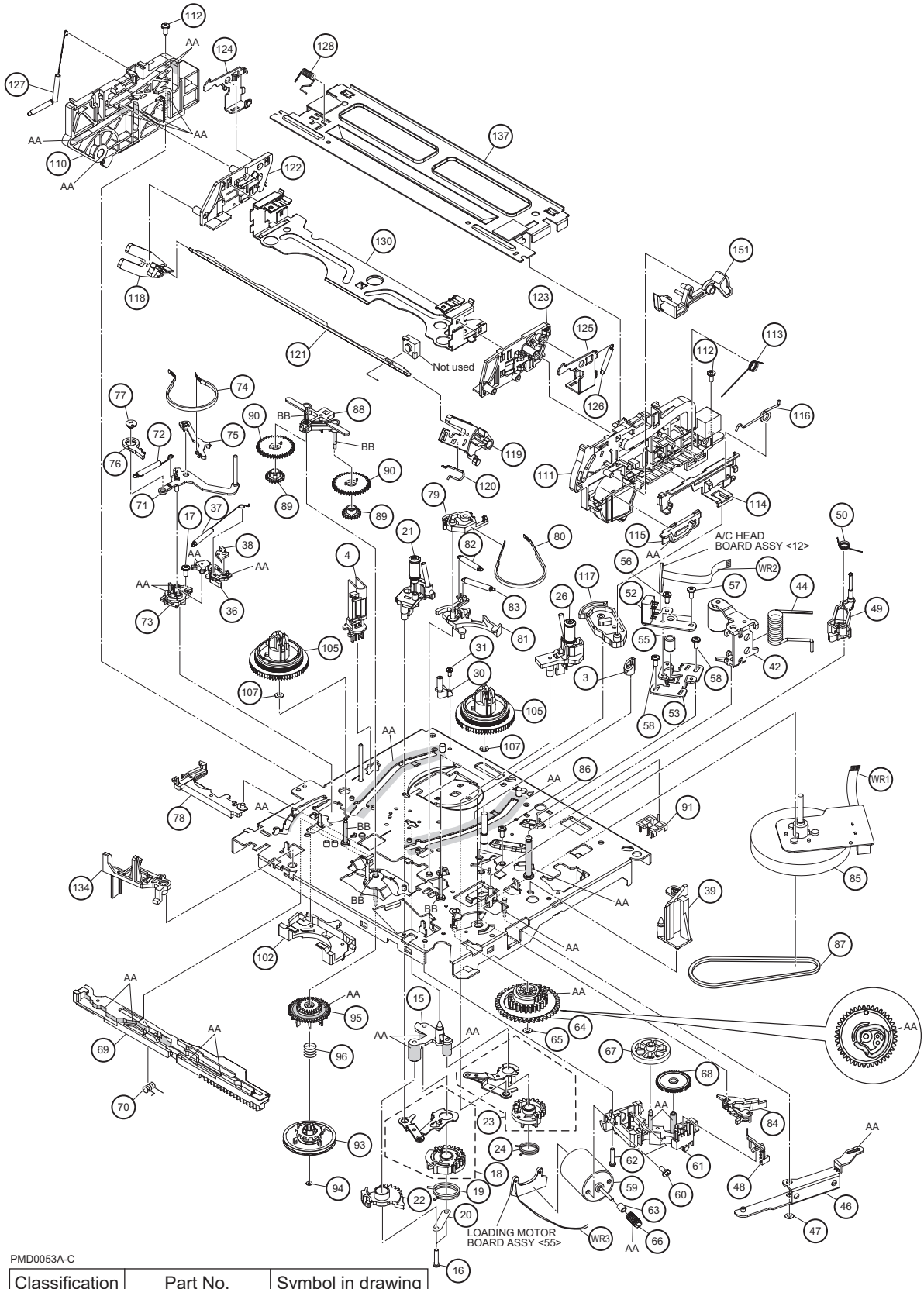
General assembly

Block No. [M][1][M][M]

⚠ Symbol No.	Part No.	Part Name	Description	Local
⚠ 1	LP10542-024A	FRONT PANEL ASSY		A
⚠ 1	LP10542-020B	FRONT PANEL ASSY		B
⚠ 1	LP10542-023B	FRONT PANEL ASSY		C
⚠ 1	LP10542-021B	FRONT PANEL ASSY		D
1A	LP21266-007B	CASSETTE DOOR		
1B	PQ46448	TORSION SPRING		
1C	LP21269-004A	COVER(L)		
2	LP31397-001A	KNOB (ADV.JOG)		
3	QYSPSFG2608ZA	TAP SCREW	M2.6 x 8mm ADV.JOG(x3)	
⚠ 4	LP10013-045C	TOP COVER		
5	QYSDSF3010RA	TAP SCREW	M3 x 10mm TOP SIDE(x2)	
6	QYSDSF3010MA	TAP SCREW	M3 x 10mm TOP REAR	
7	PDV2544A	DRUM FINAL ASSY		
⚠ 8	LP10108-016H	BOTTOM CHASSIS		
9	QYSPSPD3008ZA	SCREW	M3 x 8mm DRUM(x3)	
10	QYSPSFG3010ZA	TAP SCREW	M3 x 10mm MECHANISM(x2)	
11	QYSDSF4012ZA	TAP SCREW	M4 x 12mm MECHANISM(x2)	
⚠ 12	QMPG130-170-JC	POWER CORD(AST)	1.7m BLACK	A
⚠ 12	QMP4A10-170-K	POWER CORD(AST)	1.7m BLACK	B
⚠ 12	QMPK340-170-JC	POWER CORD(AST)	1.7m BLACK	C
⚠ 12	QMPR700-170-K	POWER CORD(AST)	1.7m BLACK	D
13	LP40910-002G	HEAD CLEANER ASSY		
13A	PQ46419-2	CLEANER		
14	LP40370-001F	ROLLER ARM ASSY		
15	PQ45160-3	INERTIA PLATE		
⚠ 16	QAM0001-001	CONVERSION PLUG		C
WR1	QUQ212-0414CG	FFC WIRE	ADV. JOG CN7003 - MAIN CN7001	

VHS mechanism assembly and parts list

Block No. M2MM



Classification	Part No.	Symbol in drawing
Grease	KYODO-SH-JB	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in **AA** and **BB** indicate lubrication and greasing areas.

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

VHS mechanism

Block No. [M][2][M][M]

⚠ Symbol No.	Part No.	Part Name	Description	Local
3	LP40097-002E	GUIDE POLE CAP		
4	NAH0004-001	FULL ERASE HEAD		
15	LP30958-001B	LOADING GEAR BASE		
16	QYTPST2620ZA	TAP SCREW		M2.6 x 20mm(x2)
17	QYTDST2606ZA	TAP SCREW		M2.6 x 6mm
18	LP40798-002A	LOADING GEAR(SUPPLY) ASSY		
19	LP40837-001A	TORSION SPRING(SUPPLY)		
20	LP40903-004A	FIXING PLATE		
21	LP40806-001D	POLE BASE ASSY(SUPPLY)		
22	LP30959-001B	LOADING GEAR		
23	LP40802-002A	LOADING GEAR(TAKE UP) ASSY		
24	LP40838-001A	TORSION SPRING(TAKE UP)		
26	LP40808-001E	POLE BASE ASSY(TAKE UP)		
30	LP31020-005A	ARM BASE		
31	QYTDST2606ZA	TAP SCREW		M2.6 x 6mm
36	LP21055-001G	TAKE UP LEVER		
37	LP40943-001A	TENSION SPRING		
38	LP40859-001D	T-UP HEAD		
39	LP30961-001C	LID GUIDE		
42	LP40810-003A	PINCH ROLLER ARM ASSY		
44	LP40840-001E	TORSION SPRING		
46	LP30963-002A	PRESS LEVER		
47	PQM30017-24	SLIT WASHER		
48	LP40930-002F	S-SWITCH		
49	LP40813-001D	GUIDE ARM ASSY		
50	LP40841-001A	TORSION SPRING		
52	NAH0005-001	AC HEAD		
53	LP30965-003A	HEAD BASE		
55	LP40842-001D	COMPRESSION SPRING		
56	QYTDST2006MA	TAP SCREW		M2 x 6mm
57	LP41036-002A	A/C ADJ.SCREW		(x2)
58	QYTDST2606ZA	TAP SCREW		M2.6 x 6mm(x2)
59	QAR0289-001	LOADING MOTOR		
60	QYTPSP3003ZA	SCREW		M3 x 3mm(x2)
61	LP21056-002J	MOTOR BRACKET		
62	QYTPST2620ZA	TAP SCREW		M2.6 x 20mm
63	LP40814-001B	WORM BEARING		
64	LP21044-001E	CONTROL CAM		
65	PQM30017-24	SLIT WASHER		
66	LP40815-001A	WORM GEAR		
67	LP40816-001B	HELICAL GEAR		
68	LP40817-001A	CONNECT GEAR		
69	LP10400-001N	CONTROL PLATE		
70	LP40843-001A	TORSION SPRING		
71	LP40818-002A	TENSION ARM ASSY		
72	LP40844-001F	TENSION SPRING		
73	LP21045-001E	TENSION ARM BASE		
74	LP40821-001A	TENSION BAND ASSY		
75	LP30967-001B	BAND HOLDER-1		
76	LP30968-001C	BAND HOLDER-2		
77	LP40822-002B	ADJUST PIN		
78	LP31000-005E	TENSION ARM LEVER		
79	LP21046-001C	MAIN BRAKE(TAKE UP)		
80	LP40824-001A	BAND BRAKE ASSY		
81	LP30969-002B	BRAKE LEVER		
82	LP30003-033C	TENSION SPRING		
83	LP30003-035C	TENSION SPRING		
84	LP40825-001A	CAPSTAN BRAKE ASSY		
⚠ 85	QAR0267-003	CAPSTAN MOTOR		
86	QYTPSG2606ZA	TAP SCREW		M2.6 x 6mm(x3)
87	LP30005-010A	BELT		CAPSTAN MOTOR
88	LP30970-001B	IDLER ARM		
89	LP40828-004A	IDLER GEAR 1		(x2)
90	LP40829-002A	IDLER GEAR 2		(x2)
91	LP31014-002A	WIRE HOLDER		
93	LP40934-001B	CLUTCH UNIT		
94	PQM30017-47	SLIT WASHER		
95	LP30973-001A	DIRECT GEAR		
96	LP40939-001A	COMPRESSION SPRING		
102	LP30974-001C	CHANGE LEVER		
105	LP21049-001A	REEL DISK		(x2)
107	LP30017-004A	SPACER		REEL DISK(x2)
110	LP10401-001L	SIDE FRAME(L)		
111	LP10402-001M	SIDE FRAME(R)		
112	QYTDST2606ZA	TAP SCREW		M2.6 x 6mm(x2)
113	LP40917-001D	TORSION SPRING		
114	LP30976-002B	SIDE PLATE		
115	LP30977-002E	LIMIT PLATE		
116	LP40846-001C	LIMIT SPRING		

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

⚠ Symbol No.	Part No.	Part Name	Description	Local
117	LP31100-002A	DRIVE LEVER		
118	LP30978-001B	DRIVE ARM(L)		
119	LP30979-001S	DRIVE ARM(R)		
120	LP40847-001B	TORSION SPRING		
121	LP30980-002A	CONNECT PLATE		
122	LP10403-001C	SIDE HOLDER(L)		
123	LP10404-001E	SIDE HOLDER(R)		
124	LP30983-002A	LOCK LEVER(L)		
125	LP30984-002A	LOCK LEVER(R)		
126	LP40924-001D	TENSION SPRING		
127	LP40972-001A	EARTH SPRING(1)		
128	LP40857-001B	EARTH SPRING(2)		
130	LP30981-003B	CASSETTE HOLDER ASSY		
134	LP21051-002C	REC SAFETY LEVER		
137	LP21052-002A	TOP FRAME		
151	LP30985-002M	DOOR OPENER		
WR1	WJT0117-001A	E-CARD WIRE		DRUM
WR2	WJT0067-001B	E-CARD WIRE		A/C HEAD CN2001
WR3	WJS0022-001A	E-FL/RB WIRE		LOADING MOTOR

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

Electrical parts list

Main board

Block No. [0][3]

⚠ Symbol No.	Part No.	Part Name	Description	Local
PW1	LPA10241-03B	MAIN BOARD ASSY		A
PW1	LPA10241-01B	MAIN BOARD ASSY		B
PW1	LPA10241-02B	MAIN BOARD ASSY		C
PW1	LPA10241-04B	MAIN BOARD ASSY		D
IC1	JCP8060-MSA	IC		
IC501	JCP8058	IC		
IC501 or	JCP8058-2	IC		
IC2201	AN3651FBP	IC		
IC3001	HD6432199RB12F	IC(MCU)	MASK	
IC3002	S-80827CNNB-G-W	IC		
IC3002 or	S-80827CNNB-G-W	IC		
IC3003	LPN0930-001B-81	IC(EEPROM)	*(REFER TO BELOW)	A
IC3003	LPN0930-002B-82	IC(EEPROM)	*(REFER TO BELOW)	B
IC3003	LPN0930-004B-04	IC(EEPROM)	*(REFER TO BELOW)	C
IC3003	LPN0930-003B-03	IC(EEPROM)	*(REFER TO BELOW)	D
IC6701	MSP3417D-X	IC		
IC6701 or	MSP3417DG3-X	IC		
IC6701 or	MSP3417G-X	IC		
IC6701 or	MSP3417GQGB8V3X	IC		
IC7002	GP1UM291QK	IR DETECT UNIT	38kHz	
IC7107	MM1117XF-XE	IC		
Q1	DTC144WKA-X	DIGI TRANSISTOR		
Q1 or	RT1N44HC-X	DIGI TRANSISTOR		
Q1 or	UN221E-X	TRANSTSTOR		
Q4	2SA1037AK/QR/-X	TRANSISTOR		
Q4 or	2SB709A/QR/-X	TRANSISTOR		
Q4 or	2SA1530A/QR/-X	TRANSISTOR		
Q7	2SC2412K/QRS/-X	TRANSISTOR		
Q7 or	2SC3928A/QRS/-X	TRANSISTOR		
Q7 or	2SD601A/QRS/-X	TRANSISTOR		
Q8	2SC2412K/QRS/-X	TRANSISTOR		
Q8 or	2SC3928A/QRS/-X	TRANSISTOR		
Q8 or	2SD601A/QRS/-X	TRANSISTOR		
Q9	2SC2412K/QRS/-X	TRANSISTOR		
Q9 or	2SC3928A/QRS/-X	TRANSISTOR		
Q9 or	2SD601A/QRS/-X	TRANSISTOR		
Q10	2SD601A/QRS/-X	TRANSISTOR		
Q10 or	2SC2412K/QRS/-X	TRANSISTOR		
Q10 or	2SC3928A/QRS/-X	TRANSISTOR		
Q12	2SA1037AK/QR/-X	TRANSISTOR		
Q12 or	2SB709A/QR/-X	TRANSISTOR		
Q12 or	2SA1530A/QR/-X	TRANSISTOR		
Q201	2SA1037AK/QR/-X	TRANSISTOR		
Q201 or	2SB709A/QR/-X	TRANSISTOR		
Q201 or	2SA1530A/QR/-X	TRANSISTOR		
Q202	2SC2412K/QRS/-X	TRANSISTOR		
Q202 or	2SC3928A/QRS/-X	TRANSISTOR		
Q202 or	2SD601A/QRS/-X	TRANSISTOR		
Q2001	2SC2412K/QRS/-X	TRANSISTOR		
Q2001 or	2SC3928A/QRS/-X	TRANSISTOR		
Q2001 or	2SD601A/QRS/-X	TRANSISTOR		
Q2002	2SC2412K/QRS/-X	TRANSISTOR		
Q2002 or	2SC3928A/QRS/-X	TRANSISTOR		
Q2002 or	2SD601A/QRS/-X	TRANSISTOR		
Q2003	DTA144WKA-X	TRANSISTOR		
Q2003 or	RT1P44HC-X	DIGI TRANSISTOR		
Q2003 or	UN211E-X	DIGI TRANSISTOR		
Q2051	2SC2412K/QRS/-X	TRANSISTOR		
Q2051 or	2SC3928A/QRS/-X	TRANSISTOR		
Q2051 or	2SD601A/QRS/-X	TRANSISTOR		
Q2052	2SA1037AK/QR/-X	TRANSISTOR		
Q2052 or	2SB709A/QR/-X	TRANSISTOR		
Q2052 or	2SA1530A/QR/-X	TRANSISTOR		
Q2053	DTC144WKA-X	DIGI TRANSISTOR		
Q2053 or	RT1N44HC-X	DIGI TRANSISTOR		
Q2053 or	UN221E-X	TRANSTSTOR		
Q2054	2SA1037AK/QR/-X	TRANSISTOR		
Q2054 or	2SB709A/QR/-X	TRANSISTOR		
Q2054 or	2SA1530A/QR/-X	TRANSISTOR		
Q2055	DTC144WKA-X	DIGI TRANSISTOR		
Q2055 or	RT1N44HC-X	DIGI TRANSISTOR		
Q2055 or	UN221E-X	TRANSTSTOR		
Q2201	UN211E-X	DIGI TRANSISTOR		
Q2201 or	DTA144WKA-X	TRANSISTOR		
Q2201 or	RT1P44HC-X	DIGI TRANSISTOR		
Q2202	DTC144WKA-X	DIGI TRANSISTOR		
Q2202 or	UN221E-X	TRANSTSTOR		
Q2202 or	RT1N44HC-X	DIGI TRANSISTOR		
Q2203	2SD601A/QRS/-X	TRANSISTOR		
Q2203 or	2SC2412K/QRS/-X	TRANSISTOR		
Q2203 or	2SC3928A/QRS/-X	TRANSISTOR		
Q2204	2SD601A/QRS/-X	TRANSISTOR		
Q2204 or	2SC2412K/QRS/-X	TRANSISTOR		
Q2204 or	2SC3928A/QRS/-X	TRANSISTOR		
Q2251	UN221E-X	TRANSTSTOR		
Q2251 or	DTC144WKA-X	DIGI TRANSISTOR		
Q2251 or	RT1N44HC-X	DIGI TRANSISTOR		
Q2252	UN221E-X	TRANSTSTOR		
Q2252 or	DTC144WKA-X	DIGI TRANSISTOR		
Q2252 or	RT1N44HC-X	DIGI TRANSISTOR		
Q2253	UN221E-X	TRANSTSTOR		
Q2253 or	DTC144WKA-X	DIGI TRANSISTOR		
Q2253 or	RT1N44HC-X	DIGI TRANSISTOR		
Q2254	DTC114EKA-X	DIGI TRANSISTOR		
Q2254 or	UN2211-X	TRANSISTOR		
Q2254 or	RT1N141C-X	DIGI TRANSISTOR		
Q2255	DTC114EKA-X	DIGI TRANSISTOR		
Q2255 or	UN2211-X	TRANSISTOR		
Q2255 or	RT1N141C-X	DIGI TRANSISTOR		
Q3003	PTZ-NV16A	IC(PHOTO SENSOR)		
Q3004	2SD601A/QRS/-X	TRANSISTOR		
Q3004 or	2SC2412K/QRS/-X	TRANSISTOR		
Q3004 or	2SC3928A/QRS/-X	TRANSISTOR		
Q3005	2SD601A/QRS/-X	TRANSISTOR		
Q3005 or	2SC2412K/QRS/-X	TRANSISTOR		
Q3005 or	2SC3928A/QRS/-X	TRANSISTOR		
Q4001	UN2211-X	TRANSISTOR		
Q4001 or	DTC114EKA-X	DIGI TRANSISTOR		
Q4001 or	RT1N141C-X	DIGI TRANSISTOR		
Q5101	2SK2632-CB14	POWER MOS FET		
Q5101 or	2SK2129-LT	POWER MOS FET		
Q5101 or	2SK2632	POWER MOS FET		
Q5101 or	2SK2129	POWER MOS FET		
Q5102	2SD2144S/UV/-T	TRANSISTOR		
Q5301	2SC1740S/RS/-T	TRANSISTOR		
Q5301 or	2SC3199/YG/-T	TRANSISTOR		
Q5303	2SC5739/QP/	TRANSISTOR		
Q5303 or	2SD2394/EF/	TRANSISTOR		
Q5304	2SD2144S/UV/-T	TRANSISTOR		
Q5305	DTA114EKA-X	DIGI TRANSISTOR		
Q5305 or	UN2111-X	TRANSISTOR		
Q5305 or	RT1P141C-X	DIGI TRANSISTOR		
Q5306	DTC114EKA-X	DIGI TRANSISTOR		
Q5306 or	UN2211-X	TRANSISTOR		
Q5306 or	RT1N141C-X	DIGI TRANSISTOR		
Q5307	2SD2144S/UV/-T	TRANSISTOR		
Q6030	2SB709A/QR/-X	TRANSISTOR		
Q6030 or	2SA1037AK/QR/-X	TRANSISTOR		
Q6030 or	2SA1530A/QR/-X	TRANSISTOR		
Q7001	2SB709A/QR/-X	TRANSISTOR		
Q7001 or	2SA1037AK/QR/-X	TRANSISTOR		
Q7001 or	2SA1530A/QR/-X	TRANSISTOR		
Q7002	2SB709A/QR/-X	TRANSISTOR		
Q7002 or	2SA1037AK/QR/-X	TRANSISTOR		
Q7002 or	2SA1530A/QR/-X	TRANSISTOR		
Q7003	2SB709A/QR/-X	TRANSISTOR		
Q7003 or	2SA1037AK/QR/-X	TRANSISTOR		
Q7003 or	2SA1530A/QR/-X	TRANSISTOR		
Q7004	2SB709A/QR/-X	TRANSISTOR		
Q7004 or	2SA1037AK/QR/-X	TRANSISTOR		
Q7004 or	2SA1530A/QR/-X	TRANSISTOR		
Q7005	2SB709A/QR/-X	TRANSISTOR		
Q7005 or	2SA1037AK/QR/-X	TRANSISTOR		
Q7005 or	2SA1530A/QR/-X	TRANSISTOR		
Q7006	2SB709A/QR/-X	TRANSISTOR		
Q7006 or	2SA1037AK/QR/-X	TRANSISTOR		

*The VCR goes to jig RCU mode after replacing the EEPROM and the VCR does not accept some RCU command.
Therefore please set the VCR to the user RCU mode after replacing the EEPROM.
The method of setting the VCR to the user RCU mode is written on the service manual.

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

⚠ Symbol No.	Part No.	Part Name	Description	Local
Q7006	or 2SA1530A/QR/-X	TRANSISTOR		
Q7007	2SB709A/QR/-X	TRANSISTOR		
Q7007	or 2SA1037AK/QR/-X	TRANSISTOR		
Q7007	or 2SA1530A/QR/-X	TRANSISTOR		
Q7008	DTC143TKA-X	DIGI TRANSISTOR		
Q7008	or UN2216-X	DIGI TRANSISTOR		
Q7009	DTC143TKA-X	DIGI TRANSISTOR		
Q7009	or UN2216-X	DIGI TRANSISTOR		
Q7010	DTC143TKA-X	DIGI TRANSISTOR		
Q7010	or UN2216-X	DIGI TRANSISTOR		
Q7011	DTC143TKA-X	DIGI TRANSISTOR		
Q7011	or UN2216-X	DIGI TRANSISTOR		
Q7012	DTC143TKA-X	DIGI TRANSISTOR		
Q7012	or UN2216-X	DIGI TRANSISTOR		
Q7013	DTC143TKA-X	DIGI TRANSISTOR		
Q7013	or UN2216-X	DIGI TRANSISTOR		
Q7014	DTC143TKA-X	DIGI TRANSISTOR		
Q7014	or UN2216-X	DIGI TRANSISTOR		
Q7104	2SB709A/QR/-X	TRANSISTOR		
Q7104	or 2SA1037AK/QR/-X	TRANSISTOR		
Q7104	or 2SA1530A/QR/-X	TRANSISTOR		
Q7106	2SB709A/QR/-X	TRANSISTOR		
Q7106	or 2SA1037AK/QR/-X	TRANSISTOR		
Q7106	or 2SA1530A/QR/-X	TRANSISTOR		
Q7107	2SB709A/QR/-X	TRANSISTOR		
Q7107	or 2SA1037AK/QR/-X	TRANSISTOR		
Q7107	or 2SA1530A/QR/-X	TRANSISTOR		
D201	1SS133-T2	SI DIODE		
D2001	1SS133-T2	SI DIODE		
D2001	or 1SS270A-T2	SI DIODE		
D2251	1SS133-T2	SI DIODE		
D2251	or 1SS270A-T2	SI DIODE		
D3001	LNB2301L01VI	LED		
D3002	1SS133-T2	SI DIODE		
D3002	or 1SS270A-T2	SI DIODE		
D3003	RD39ES/B3/-T2	Z DIODE		
D3003	or MTZJ39C-T2	Z DIODE		
D3004	10EDB20-T2	SI DIODE		
D3004	or 1A3G-T2	SI DIODE		
⚠ D3005	10EDB20-T2	SI DIODE		
⚠ D3005	or 1A3G-T2	SI DIODE		
D4002	1SS133-T2	SI DIODE		
D4002	or 1SS270A-T2	SI DIODE		
D5001	S1WB/A/60-4102	BRIDGE DIODE		
D5001	or S1WB/A/60-X	BRIDGE DIODE		
D5101	AU01-T2	SI DIODE		
D5101	or 1SR153-400-T2	FR DIODE		
D5101	or ERA18-04-T2	FR DIODE		
D5101	or 10ERB40-T2	FR DIODE		
D5102	AU01-T2	SI DIODE		
D5102	or 1SR153-400-T2	FR DIODE		
D5102	or ERA18-04-T2	FR DIODE		
D5102	or 10ERB40-T2	FR DIODE		
D5103	1SS133-T2	SI DIODE		
D5103	or 1SS270A-T2	SI DIODE		
D5105	1SS133-T2	SI DIODE		
D5105	or 1SS270A-T2	SI DIODE		
D5203	AU01Z-T2	FR DIODE		
D5203	or 10ERB20-T2	FR DIODE		
D5203	or 1F4G-T2	FR DIODE		
D5204	AU01Z-T2	FR DIODE		
D5204	or 10ERB20-T2	FR DIODE		
D5204	or 1F4G-T2	FR DIODE		
D5207	AK04-T2	SB DIODE		
⚠ D5207	or 11EQS04-T2	SB DIODE		
⚠ D5207	or 1S4-T2	SB DIODE		
⚠ D5207	or SBO40-T2	SB DIODE		
D5209	AK04-T2	SB DIODE		
D5209	or 11EQS04-T2	SB DIODE		
D5209	or 1S4-T2	SB DIODE		
D5209	or SBO40-T2	SB DIODE		
D5210	1F4G-T2	FR DIODE		
D5210	or AU01Z-T2	FR DIODE		
D5210	or 1SR153-400-T2	FR DIODE		
D5210	or 10ERB20-T2	FR DIODE		
D5210	or PG104RS-T2	FR DIODE		
D5301	MTZJ15C-T2	Z DIODE		
D5301	or RD15ES/B3/-T2	Z DIODE		
D5302	MTZJ11C-T2	Z DIODE		
D5302	or RD11ES/B3/-T2	Z DIODE		
D5303	MTZJ5.6A-T2	Z DIODE		
D5303	or RD5.6ES/B1/-T2	Z DIODE		
D5305	MTZJ5.6C-T2	Z DIODE		
D5305	or RD5.6ES/B3/-T2	Z DIODE		
D6002	HZ30-2L-T2	Z DIODE		
D6002	or MTZJ30D-T2	Z DIODE		
PC3001	RPI-304J	IC(PHOTO SENSOR)		
PC3002	RPI-304J	IC(PHOTO SENSOR)		
⚠ PC5101	PC123Y22FZ	PHOTO COUPLER		
C1	NDC31HJ-151X	C CAPACITOR	150pF 50V J	
C2	NDC31HJ-4R0X	C CAPACITOR	4pF 50V J	
C3	NDC31HJ-470X	C CAPACITOR	47pF 50V J	
C4	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C5	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C6	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C7	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C8	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C9	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C10	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C11	QEPF1HM-105Z	E CAPACITOR	1uF 50V M	
C12	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C14	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C15	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C16	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C18	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C19	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C20	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C21	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C23	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C24	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C25	QEKJ1HM-335Z	E CAPACITOR	3.3uF 50V M	
C26	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C27	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C30	NDC31HJ-331X	C CAPACITOR	330pF 50V J	
C31	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C32	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C33	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C34	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C35	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C36	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C37	NDC31HJ-3R0X	C CAPACITOR	3pF 50V J	
C38	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C39	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C40	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C41	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C43	QEKJ1HM-335Z	E CAPACITOR	3.3uF 50V M	
C44	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C45	NCB31EK-472X	C CAPACITOR	4700pF 25V K	
C46	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C47	QEKJ1HM-474Z	E CAPACITOR	0.47uF 50V M	
C48	NCB31EK-223X	C CAPACITOR	0.022uF 25V K	
C49	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C50	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C51	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
C52	NDC31HJ-150X	C CAPACITOR	15pF 50V J	
C55	NDC31HJ-151X	C CAPACITOR	150pF 50V J	
C56	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C57	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C58	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C59	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C60	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C61	QEKC0JM-476Z	E CAPACITOR	47uF 6.3V M	
C62	QCBB1HK-103Y	C CAPACITOR	0.01uF 50V K	
C63	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C64	QCBB1HK-103Y	C CAPACITOR	0.01uF 50V K	
C71	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C73	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
C201	NDC31HJ-220X	C CAPACITOR	22pF 50V J	
C202	QERF1EM-475Z	E CAPACITOR	4.7uF 25V M	
C203	NCB31HK-102X	C CAPACITOR	1000pF 50V K	
C204	NCB31HK-681X	C CAPACITOR	680pF 50V K	
C205	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C207	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

⚠ Symbol No.	Part No.	Part Name	Description	Local
C209	QERF0JM-476Z	E CAPACITOR	47uF 6.3V M	
C210	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C212	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C213	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C501	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C502	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C503	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C504	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C507	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C508	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C509	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C510	QCBB1HK-103Y	C CAPACITOR	0.01uF 50V K	
C511	QEKJ0JM-337Z	E CAPACITOR	330uF 6.3V M	
C513	NDC31HJ-221X	C CAPACITOR	220pF 50V J	
C514	NDC31HG-271X	C CAPACITOR	270pF 50V G	
C515	NDC31HJ-121X	C CAPACITOR	120pF 50V J	
C516	NDC31HG-271X	C CAPACITOR	270pF 50V G	
C517	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C518	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C519	NDC31HG-271X	C CAPACITOR	270pF 50V G	
C520	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C521	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C522	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C523	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C524	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C525	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C528	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C529	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C530	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C540	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C550	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C2001	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2002	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C2003	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C2005	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2006	NCB31EK-682X	C CAPACITOR	6800pF 25V K	
C2007	QEKJ1CM-226Z	E CAPACITOR	22uF 16V M	
C2008	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2009	NCB31HK-122X	C CAPACITOR	1200pF 50V K	
C2010	NCB31HK-152X	C CAPACITOR	1500pF 50V K	
C2011	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2012	QEKC1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2051	NDC31HJ-331X	C CAPACITOR	330pF 50V J	
C2052	QFLC1HJ-823Z	M CAPACITOR	0.082uF 50V J	
C2053	NCB31EK-472X	C CAPACITOR	4700pF 25V K	
C2054	NCB31EK-223X	C CAPACITOR	0.022uF 25V K	
C2055	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2201	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2202	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2203	QEKJ1HM-475Z	E CAPACITOR	4.7uF 50V M	
C2204	QEKJ0JM-336Z	E CAPACITOR	33uF 6.3V M	
C2205	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2206	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2207	NCB31EK-153X	C CAPACITOR	0.015uF 25V K	
C2208	NCB31EK-153X	C CAPACITOR	0.015uF 25V K	
C2209	QERF1CM-106Z	E CAPACITOR	10uF 16V M	
C2210	QERF1CM-106Z	E CAPACITOR	10uF 16V M	
C2211	QEKJ0JM-336Z	E CAPACITOR	33uF 6.3V M	
C2212	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C2214	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2215	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2216	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C2218	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2219	QEKJ1CM-226Z	E CAPACITOR	22uF 16V M	
C2220	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C2221	NCB31EK-223X	C CAPACITOR	0.022uF 25V K	
C2222	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C2223	NCB31CK-473X	C CAPACITOR	0.047uF 16V K	
C2224	NCB31CK-473X	C CAPACITOR	0.047uF 16V K	
C2227	QERF1CM-106Z	E CAPACITOR	10uF 16V M	
C2251	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C2252	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C2253	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C2254	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C2255	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C2256	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C2257	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C2258	NDC31HJ-181X	C CAPACITOR	180pF 50V J	
C2259	QEKJ1HM-334Z	E CAPACITOR	0.33uF 50V M	
C3004	NCB31CK-473X	C CAPACITOR	0.047uF 16V K	
C3008	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C3011	QETL0JM-338	E CAPACITOR	3300uF 6.3V M	
C3012	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C3013	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C3014	QERF0JM-476Z	E CAPACITOR	47uF 6.3V M	
C3016	NCB31CK-473X	C CAPACITOR	0.047uF 16V K	
C3022	NCB31CK-473X	C CAPACITOR	0.047uF 16V K	
C3024	NDC21HJ-180X	C CAPACITOR	18pF 50V J	
C3025	QAT3725-300Z	TRIM CAPACITOR	30pF TIMER CLOCK	
C3030	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C3033	NCB31CK-473X	C CAPACITOR	0.047uF 16V K	
C3036	NDC31HJ-180X	C CAPACITOR	18pF 50V J	
C3037	NDC21HJ-120X	C CAPACITOR	12pF 50V J	
C3045	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C3050	NCF31EZ-104X	C CAPACITOR	0.1uF 25V Z	
C3052	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C3053	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
C3056	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C3057	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C3071	QEKJ1CM-336Z	E CAPACITOR	33uF 16V M	
C3072	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C3076	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C4002	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C4004	QERF1CM-226Z	E CAPACITOR	22uF 16V M	
C4005	NCB31HK-222X	C CAPACITOR	2200pF 50V K	
C4006	QERF0JM-476Z	E CAPACITOR	47uF 6.3V M	
C4008	QEQF1HM-105Z	E CAPACITOR	1uF 50V M	
C4009	NCB31CK-563X	C CAPACITOR	0.056uF 16V K	
C4010	NCB31EK-223X	C CAPACITOR	0.022uF 25V K	
C4011	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C4012	QEKJ1HM-224Z	E CAPACITOR	0.22uF 50V M	
C4014	NDC31HJ-101X	C CAPACITOR	100pF 50V J	
C4015	NCB31HK-102X	C CAPACITOR	1000pF 50V K	
C4016	NDC31HJ-101X	C CAPACITOR	100pF 50V J	
⚠ C5001	QFZ9072-473	MM CAPACITOR	0.047uF AC250V K	
⚠ C5003	QCZ9071-101	C CAPACITOR	100pF AC400V K	
⚠ C5004	QCZ9071-222	C CAPACITOR	2200pF AC400V M	
C5006	QEZ0375-686	E CAPACITOR	68uF 400V M	
C5101	QCZ0212-472	C CAPACITOR	4700pF 1kV K	
C5102	QCZ0339-101Z	C CAPACITOR	100pF 1kV K	
C5104	QEKJ1HM-105Z	E CAPACITOR	1uF 50V M	
C5105	NCB31EK-183X	C CAPACITOR	0.018uF 25V K	
C5106	NDC31HJ-271X	C CAPACITOR	270pF 50V J	
C5107	NCB31CK-104X	C CAPACITOR	0.1uF 16V K	
C5202	QETN1CM-108Z	E CAPACITOR	1000uF 16V M	
C5203	QEMT1AM-687	E CAPACITOR	680uF 10V M	
C5204	QETJ2AM-475Z	E CAPACITOR	4.7uF 100V M	
C5206	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C5207	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C5303	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C5305	NCB31CK-224X	C CAPACITOR	0.22uF 16V K	
C5307	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C5308	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C6006	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	C,D
C6008	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	C,D
C6013	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C6014	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	C,D
C6016	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	C,D
C6027	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C6028	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C6037	QEKJ1HM-106Z	E CAPACITOR	10uF 50V M	
C6057	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C6058	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C6704	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C6707	NDC31HJ-470X	C CAPACITOR	47pF 50V J	
C6708	NDC31HJ-8R0X	C CAPACITOR	8pF 50V J	
C6709	NDC31HJ-2R0X	C CAPACITOR	2pF 50V J	
C6713	NCF31CZ-224X	C CAPACITOR	0.22uF 16V Z	
C6714	NCB31HK-222X	C CAPACITOR	2200pF 50V K	
C6715	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C6716	NCB31HK-222X	C CAPACITOR	2200pF 50V K	
C6717	QEKJ1HM-225Z	E CAPACITOR	2.2uF 50V M	
C6719	QEKJ1HM-106Z	E CAPACITOR	10uF 50V M	
C6720	QEKJ1HM-106Z	E CAPACITOR	10uF 50V M	
C6721	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C6723	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

⚠ Symbol No.	Part No.	Part Name	Description	Local
C7011	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C7102	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C7103	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C7104	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C7105	QEKJ1EM-106Z	E CAPACITOR	10uF 25V M	
C7107	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C7108	QEKJ1CM-107Z	E CAPACITOR	100uF 16V M	
C7109	QEKJ1CM-476Z	E CAPACITOR	47uF 16V M	
C7114	QETN0JM-477Z	E CAPACITOR	470uF 6.3V M	
C7119	NCB31HK-681X	C CAPACITOR	680pF 50V K	
C7120	NCB31HK-681X	C CAPACITOR	680pF 50V K	
C7123	NCB31EK-103X	C CAPACITOR	0.01uF 25V K	
C7124	QETJ0JM-477Z	E CAPACITOR	470uF 6.3V M	
C7125	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C7126	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	
C7164	NCB31HK-681X	C CAPACITOR	680pF 50V K	
C7165	NCB31HK-681X	C CAPACITOR	680pF 50V K	
R1	NRSA63J-622X	MG RESISTOR	6.2kΩ 1/16W J	
R2	NRSA63J-152X	MG RESISTOR	1.5kΩ 1/16W J	
R3	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R4	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J	
R11	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R12	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R14	NRSA63J-182X	MG RESISTOR	1.8kΩ 1/16W J	
R17	NRSA63J-681X	MG RESISTOR	680Ω 1/16W J	
R21	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J	
R22	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J	
R25	NRSA63J-122X	MG RESISTOR	1.2kΩ 1/16W J	
R31	NRSA63J-471X	MG RESISTOR	470Ω 1/16W J	
R36	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R37	NRSA63J-153X	MG RESISTOR	15kΩ 1/16W J	
R38	NRSA63J-685X	MG RESISTOR	6.8MΩ 1/16W J	
R201	NRSA63J-471X	MG RESISTOR	470Ω 1/16W J	
R202	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R203	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R204	NRSA63J-474X	MG RESISTOR	470kΩ 1/16W J	
R205	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J	
R207	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R208	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R209	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R210	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R211	NRSA63J-471X	MG RESISTOR	470Ω 1/16W J	
R212	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R214	NRSA63J-474X	MG RESISTOR	470kΩ 1/16W J	
R501	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J	
R503	NRVA63D-152X	CMF RESISTOR	1.5kΩ 1/16W D	
R504	NRVA63D-561X	CMF RESISTOR	560Ω 1/16W D	
R505	NRVA63D-102X	CMF RESISTOR	1kΩ 1/16W D	
R506	NRVA63D-392X	CMF RESISTOR	3.9kΩ 1/16W D	
R507	NRVA63D-392X	CMF RESISTOR	3.9kΩ 1/16W D	
R508	NRVA63D-102X	CMF RESISTOR	1kΩ 1/16W D	
R510	NRSA63J-475X	MG RESISTOR	4.7MΩ 1/16W J	
R2003	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R2005	QRE141J-153Y	C RESISTOR	15kΩ 1/4W J	
R2007	NRSA63J-183X	MG RESISTOR	18kΩ 1/16W J	
R2008	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R2010	NRSA63J-123X	MG RESISTOR	12kΩ 1/16W J	
R2013	NRSA63J-123X	MG RESISTOR	12kΩ 1/16W J	
R2014	NRSA63J-394X	MG RESISTOR	390kΩ 1/16W J	
R2015	NRSA63J-301X	MG RESISTOR	300Ω 1/16W J	
R2016	NRSA63J-393X	MG RESISTOR	39kΩ 1/16W J	
R2017	NRSA63J-183X	MG RESISTOR	18kΩ 1/16W J	
R2018	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R2019	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R2021	NRSA63J-333X	MG RESISTOR	33kΩ 1/16W J	
R2022	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R2023	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R2053	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J	
R2054	NRSA63J-123X	MG RESISTOR	12kΩ 1/16W J	
R2055	NRSA63J-3R3X	MG RESISTOR	3.3Ω 1/16W J	
R2056	QRE141J-820Y	C RESISTOR	82Ω 1/4W J	
R2057	NRSA63J-473X	MG RESISTOR	47kΩ 1/16W J	
R2058	NRSA63J-183X	MG RESISTOR	18kΩ 1/16W J	
R2059	NRSA63J-473X	MG RESISTOR	47kΩ 1/16W J	
R2060	NRSA63J-183X	MG RESISTOR	18kΩ 1/16W J	
R2201	NRSA63J-473X	MG RESISTOR	47kΩ 1/16W J	
R2202	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J	
R2203	NRSA63J-473X	MG RESISTOR	47kΩ 1/16W J	
R2204	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J	
R2205	NRSA63J-473X	MG RESISTOR	47kΩ 1/16W J	
R2206	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J	
R2207	NRSA63J-473X	MG RESISTOR	47kΩ 1/16W J	
R2208	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J	
R2209	NRSA63J-681X	MG RESISTOR	680Ω 1/16W J	
R2210	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R2211	NRSA63J-272X	MG RESISTOR	2.7kΩ 1/16W J	
R2212	NRSA63J-272X	MG RESISTOR	2.7kΩ 1/16W J	
R2213	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R2214	NRSA63J-681X	MG RESISTOR	680Ω 1/16W J	
R2215	QRE141J-181Y	C RESISTOR	180Ω 1/4W J	
R2216	NRSA63J-122X	MG RESISTOR	1.2kΩ 1/16W J	
R2217	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R2218	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J	
R2219	NRSA63J-122X	MG RESISTOR	1.2kΩ 1/16W J	
R2220	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R2222	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R2223	NRSA63J-511X	MG RESISTOR	510Ω 1/16W J	
R2224	NRSA63J-511X	MG RESISTOR	510Ω 1/16W J	
R2225	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R2226	NRSA63J-273X	MG RESISTOR	27kΩ 1/16W J	
R2227	NRSA63J-393X	MG RESISTOR	39kΩ 1/16W J	
R2228	NRSA63J-273X	MG RESISTOR	27kΩ 1/16W J	
R2229	NRSA63J-393X	MG RESISTOR	39kΩ 1/16W J	
R2234	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R2251	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R2252	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J	
R2253	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R2254	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J	
R2255	NRSA63J-273X	MG RESISTOR	27kΩ 1/16W J	
R2256	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J	
R3024	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3033	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R3034	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R3035	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3038	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R3039	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3040	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3043	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3054	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R3059	NRSA63J-331X	MG RESISTOR	330Ω 1/16W J	
R3060	NRSA63J-331X	MG RESISTOR	330Ω 1/16W J	
R3061	NRSA63J-331X	MG RESISTOR	330Ω 1/16W J	
R3062	NRSA63J-331X	MG RESISTOR	330Ω 1/16W J	
R3063	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3064	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3065	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3066	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3067	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R3069	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3072	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3073	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3074	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3077	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R3080	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R3082	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R3083	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R3084	QRE141J-102Y	C RESISTOR	1kΩ 1/4W J	
R3085	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R3086	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R3088	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R3096	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R3099	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R3102	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R3205	NRSA63J-181X	MG RESISTOR	180Ω 1/16W J	
R3207	NRSA63J-183X	MG RESISTOR	18kΩ 1/16W J	
R3208	NRSA63J-121X	MG RESISTOR	120Ω 1/16W J	
R3209	NRSA63J-183X	MG RESISTOR	18kΩ 1/16W J	
R3210	NRSA63J-121X	MG RESISTOR	120Ω 1/16W J	
R3211	NRSA63J-183X	MG RESISTOR	18kΩ 1/16W J	
R3212	NRSA63J-474X	MG RESISTOR	470kΩ 1/16W J	
R3213	NRSA63J-334X	MG RESISTOR	330kΩ 1/16W J	
R3214	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3215	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3216	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3217	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

⚠ Symbol No.	Part No.	Part Name	Description	Local
R3218	QRE141J-472Y	C RESISTOR	4.7kΩ 1/4W J	
R3219	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R3220	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J	
R3221	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J	
R3222	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3223	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J	
R3224	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J	
R3225	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3229	NRSA63J-105X	MG RESISTOR	1MΩ 1/16W J	
R3235	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J	
R3236	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J	
R3244	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3245	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3246	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R3248	NCB31HK-222X	C CAPACITOR	2200pF 50V K	
R3253	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J	
R4001	QRE141J-472Y	C RESISTOR	4.7kΩ 1/4W J	
R4003	NRSA63J-561X	MG RESISTOR	560Ω 1/16W J	
R4004	NRSA63J-561X	MG RESISTOR	560Ω 1/16W J	
R4005	NRSA63J-562X	MG RESISTOR	5.6kΩ 1/16W J	
R4007	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R4009	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R4012	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J	
R4015	NRSA63J-223X	MG RESISTOR	22kΩ 1/16W J	
R4017	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R5101	QRE141J-224Y	C RESISTOR	220kΩ 1/4W J	
R5102	QRE141J-224Y	C RESISTOR	220kΩ 1/4W J	
R5103	QRE141J-683Y	C RESISTOR	68kΩ 1/4W J	
R5104	QRG02GJ-683	OMF RESISTOR	68kΩ 2W J	
R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω 1W J	
R5107	QRE121J-331Y	C RESISTOR	330Ω 1/2W J	
R5108	NRSA63J-152X	MG RESISTOR	1.5kΩ 1/16W J	
R5109	NRSA63J-561X	MG RESISTOR	560Ω 1/16W J	
R5110	NRSA63J-224X	MG RESISTOR	220kΩ 1/16W J	
R5111	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R5112	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J	
R5302	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R5303	NRSA63J-122X	MG RESISTOR	1.2kΩ 1/16W J	
R5304	QRE141J-471Y	C RESISTOR	470Ω 1/4W J	
R5306	NRSA63J-181X	MG RESISTOR	180Ω 1/16W J	
R5310	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R5312	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R5313	NRSA63J-821X	MG RESISTOR	820Ω 1/16W J	
R5319	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J	
R5332	QRE121J-391Y	C RESISTOR	390Ω 1/2W J	
R6020	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R6021	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R6030	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R6031	NRSA63J-271X	MG RESISTOR	270Ω 1/16W J	
R6032	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R6050	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R6051	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R6052	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R6056	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R6708	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R6709	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R6711	QRE141J-104Y	C RESISTOR	100kΩ 1/4W J	
R6712	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R6713	NRSA63J-123X	MG RESISTOR	12kΩ 1/16W J	
R6714	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R6715	NRSA63J-123X	MG RESISTOR	12kΩ 1/16W J	
R6716	QRE141J-470Y	C RESISTOR	47Ω 1/4W J	
R6719	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R6720	QRE141J-562Y	C RESISTOR	5.6kΩ 1/4W J	
R6721	NRSA63J-562X	MG RESISTOR	5.6kΩ 1/16W J	
R7001	NRSA63J-151X	MG RESISTOR	150Ω 1/16W J	
R7002	NRSA63J-151X	MG RESISTOR	150Ω 1/16W J	
R7003	NRSA63J-151X	MG RESISTOR	150Ω 1/16W J	
R7004	NRSA63J-151X	MG RESISTOR	150Ω 1/16W J	
R7005	NRSA63J-151X	MG RESISTOR	150Ω 1/16W J	
R7006	NRSA63J-151X	MG RESISTOR	150Ω 1/16W J	
R7007	NRSA63J-151X	MG RESISTOR	150Ω 1/16W J	
R7015	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J	
R7020	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R7021	NRSA63J-122X	MG RESISTOR	1.2kΩ 1/16W J	
R7022	NRSA63J-182X	MG RESISTOR	1.8kΩ 1/16W J	
R7023	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J	
R7024	NRSA63J-272X	MG RESISTOR	2.7kΩ 1/16W J	
R7025	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
R7026	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J	
R7030	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J	
R7031	NRSA63J-122X	MG RESISTOR	1.2kΩ 1/16W J	
R7032	NRSA63J-182X	MG RESISTOR	1.8kΩ 1/16W J	
R7033	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J	
R7034	NRSA63J-272X	MG RESISTOR	2.7kΩ 1/16W J	
R7108	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R7109	QRE141J-331Y	C RESISTOR	330Ω 1/4W J	
R7121	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
R7123	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R7134	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
R7135	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R7136	QRE141J-331Y	C RESISTOR	330Ω 1/4W J	
R7137	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
R7138	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R7139	QRE141J-331Y	C RESISTOR	330Ω 1/4W J	
R7140	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
R7141	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
R7142	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
R7143	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
R7151	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
R7152	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
R7160	NRSA63J-331X	MG RESISTOR	330Ω 1/16W J	
R7161	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	
R7162	NRSA63J-331X	MG RESISTOR	330Ω 1/16W J	
R7163	NRSA63J-750X	MG RESISTOR	75Ω 1/16W J	
VR2251	QRE141J-472Y	C RESISTOR	4.7kΩ 1/4W J A.REC FM	
L1	QQL071J-121Y	COIL	120uH J	
L3	QQL29BJ-100Z	P COIL	10uH J	
L5	QQL29BJ-100Z	P COIL	10uH J	
L6	QQL29BJ-100Z	P COIL	10uH J	
L7	QQR0967-001	CHOKE COIL		
L9	QQL071J-100Y	COIL	10uH J	
L10	QQL29BJ-100Z	P COIL	10uH J	
L201	QQL071J-150Y	COIL	15uH J	
L204	QQL071J-151Y	COIL	150uH J	
L501	QQL29BJ-101Z	P COIL	100uH J	
L502	QQL29BJ-100Z	P COIL	10uH J	
L2251	QQL29BJ-100Z	P COIL	10uH J	
L2252	QQL29BJ-151Z	P COIL	150uH J	
L3001	QQL231J-100Y	COIL	10uH J	
L4001	QQL231J-1R0Y	COIL	1uH J	
L5201	PELN1184	CHOKE COIL		
L5202	PELN1184	CHOKE COIL		
L6001	QQL29BK-1R0Z	P COIL	1uH K	C,D
L6002	QQL29BJ-100Z	P COIL	10uH J	A,B
L6002	QQL29BK-1R0Z	P COIL	1uH K	C,D
L6501	QQL29BK-1R0Z	P COIL	1uH K	
L7103	QQL342J-100Z	COIL	10uH J	
L7104	QQL29BJ-100Z	P COIL	10uH J	
T2051	QQR0002-001	BIAS COIL		
⚠ T5001	QQS0265-001	SW TRANSF		
B3	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
B5	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
B501	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
B502	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
B3003	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
B6051	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
CN1	QGF1201C2-09	CONNECTOR	FFC/FPC (1-9)	
CN2001	QGF1207C1-06	CONNECTOR	FFC/FPC (1-6)	
CN2002	QGB2532J1-02	CONNECTOR	B-B (1-2)	
CN3001	QGB2032M4-12	CONNECTOR	B-B (1-12)	
⚠ CN5001	QGA7901C3-02	CONNECTOR	W-B (1-2)	
CN7001	QGF1207C1-04	CONNECTOR	FFC/FPC (1-4)	
⚠ CP3002	NMFZ012-1R0X-M	FUSE	1A 50V	
⚠ CP4002	NMFZ012-1R0X-M	FUSE	1A 50V	
DI7001	CA242M5-A1	LED		
⚠ F5001	QMF51E2-2R0-J1	FUSE	2A AC250V	
FC5001	QNG0006-001Z	FUSE CLIP		
FC5002	QNG0006-001Z	FUSE CLIP		
HS1	LP40090-001A	HEAT SINK	Q5101	
J7101	QNN0552-001	PIN JACK	REAR IN	
J7102	QND0076-001	S JACK	S VIDEO REAR IN	
J7103	QNN0552-001	PIN JACK	REAR OUT	
J7104	QND0076-001	S JACK	S VIDEO REAR OUT	

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

⚠ Symbol No.	Part No.	Part Name	Description	Local
J7105	QNN0381-002	PIN JACK	FRONT IN	
J7106	QND0106-001	S JACK	S-VHS FRONT IN	
JS3001	NSW0238-001	ROTARY ENCODER		
K5101	QQR0678-001Z	FERRITE BEADS		
K6701	NQR0129-003X	FERRITE BESDA		
K6702	NQR0129-003X	FERRITE BESDA		
K6703	NQR0129-003X	FERRITE BESDA		
K6704	NQR0129-003X	FERRITE BESDA		
K6705	NQR0129-003X	FERRITE BESDA		
K6706	NQR0129-003X	FERRITE BESDA		
⚠ LF5002	QQR0978-001	LINE FILTER		
OT1	QYSDSF3010MA	TAP SCREW	M3 x 10mm TERMINAL BOARD(x2)	
OT2	PQ21623-2-5	EARTH PLATE(RF)		
OT3	QYTDST3006ZA	TAP SCREW	M3 x 6mm Q5101	
S3001	QSW0602-004	PUSH SWITCH	REC.SAFETY	
S3002	QSW0602-004	PUSH SWITCH	S.CASSTTE	
S7002	QSW1061-001Z	TACT SWITCH	POWER	
S7003	QSW1061-001Z	TACT SWITCH	TIMER	
S7004	QSW1061-001Z	TACT SWITCH	REC LINK	
S7006	QSW1061-001Z	TACT SWITCH	SP/LP/EP	
S7010	QSW1061-001Z	TACT SWITCH	REC	
S7011	QSW1061-001Z	TACT SWITCH	PAUSE	
S7013	QSW1061-001Z	TACT SWITCH	S-VHS ET	
S7015	QSW1061-001Z	TACT SWITCH	PLAY	
S7017	QSW1061-001Z	TACT SWITCH	SP/LP/EP	
SD1	LP21105-002A	SHIELD CASE		
TB1	LP20887-016A	TERMINAL BOARD		
TU6001	QAU0323-001	TUNER		A,B
TU6001	QAU0236-001	TUNER		C,D
W1	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W2	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W3	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W4	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W6	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W8	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W9	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W10	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W12	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W13	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W15	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W16	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W17	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W18	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W19	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W20	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W24	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	
W867	QQL231J-120Y	COIL	12uH J	
X1	QAX0740-001	CRYSTAL	4.433619MHz	
X2	QAX0739-001	CRYSTAL	3.57MHz	
X3001	QAX0445-001	CRYSTAL	32.768kHz	
X3002	QAX0527-001	CRYSTAL	10.000000MHz	
X6701	QAX0443-001	CRYSTAL	18.432MHz	

2D digital board

Block No. [0][5]

⚠ Symbol No.	Part No.	Part Name	Description	Local
PW1	LPA10162-08A	2D DIGITAL BOARD ASSY		
IC1201	JCP8036	IC		
Q1201	2SC1317/RS/-T	TRANSISTOR		
Q1202	2SA1576A/QR/-X	TRANSISTOR		
Q1202 or	2PA1576/R/-X	TRANSISTOR		
Q1203	2SA1576A/QR/-X	TRANSISTOR		
Q1203 or	2PA1576/R/-X	TRANSISTOR		
Q1204	2SC4081/QRS/-X	TRANSISTOR		
Q1204 or	2PC4081/R/-X	TRANSISTOR		
Q1205	2SC4081/S/-X	TRANSISTOR		
D1201	RD4.3ES/B3/-T2	Z DIODE		
C1201	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C1208	NDC21HJ-221X	C CAPACITOR	220pF 50V J	
C1210	NDC21HJ-330X	C CAPACITOR	33pF 50V J	
C1211	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C1212	NCB21HK-102X	C CAPACITOR	1000pF 50V K	
C1213	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1214	NCF21CZ-105X	C CAPACITOR	1uF 16V Z	
C1215	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C1216	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1217	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1218	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1219	NCF21CZ-105X	C CAPACITOR	1uF 16V Z	
C1220	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C1222	NDC21HJ-820X	C CAPACITOR	82pF 50V J	
C1223	NDC21HJ-270X	C CAPACITOR	27pF 50V J	
C1225	NDC21HJ-820X	C CAPACITOR	82pF 50V J	
C1226	NDC21HJ-270X	C CAPACITOR	27pF 50V J	
C1227	NCB21EK-104X	C CAPACITOR	0.1uF 25V K	
C1228	QEKJ1EM-475Z	E CAPACITOR	4.7uF 25V M	
C1229	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C1230	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1231	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1232	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1233	QDYB1CM-103Y	C CAPACITOR	0.01uF 16V M	
C1234	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1235	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
C1236	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1237	NCF21EZ-104X	C CAPACITOR	0.1uF 25V Z	
C1238	NDC21HJ-180X	C CAPACITOR	18pF 50V J	
C1239	NDC21HJ-560X	C CAPACITOR	56pF 50V J	
C1243	NCB21HK-103X	C CAPACITOR	0.01uF 50V K	
C1244	QEKJ1EM-475Z	E CAPACITOR	4.7uF 25V M	
C1245	NDC21HJ-150X	C CAPACITOR	15pF 50V J	
C1246	QEKJ0JM-476Z	E CAPACITOR	47uF 6.3V M	
R1201	NRSA02J-121X	MG RESISTOR	120Ω 1/10W J	
R1202	NRSA02J-101X	MG RESISTOR	100Ω 1/10W J	
R1203	NRSA02J-221X	MG RESISTOR	220Ω 1/10W J	
R1204	NRSA02J-221X	MG RESISTOR	220Ω 1/10W J	
R1205	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R1206	NRSA02J-561X	MG RESISTOR	560Ω 1/10W J	
R1207	NRSA02J-562X	MG RESISTOR	5.6kΩ 1/10W J	
R1208	NRSA02J-123X	MG RESISTOR	12kΩ 1/10W J	
R1209	NRSA02J-180X	MG RESISTOR	18Ω 1/10W J	
R1210	NRVA02D-393X	CMF RESISTOR	39kΩ 1/10W D	
R1211	NRVA02D-153X	CMF RESISTOR	15kΩ 1/10W D	
R1212	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R1213	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R1214	NRSA02J-101X	MG RESISTOR	100Ω 1/10W J	
R1215	NRSA02J-102X	MG RESISTOR	1kΩ 1/10W J	
R1216	NRSA02J-331X	MG RESISTOR	330Ω 1/10W J	
R1217	NRVA02D-101X	CMF RESISTOR	100Ω 1/10W D	
R1218	NRVA02D-301X	CMF RESISTOR	300Ω 1/10W D	
R1220	NRSA02J-561X	MG RESISTOR	560Ω 1/10W J	
R1222	NRSA02J-471X	MG RESISTOR	470Ω 1/10W J	
R1224	NRSA02J-561X	MG RESISTOR	560Ω 1/10W J	
L1201	QQL071J-1R0Y	COIL	1uH J	
L1202	QRE141J-181Y	C RESISTOR	180Ω 1/4W J	
L1203	QQL29BJ-331Z	P COIL	330uH J	
L1204	QQL29BJ-221Z	P COIL	220uH J	
L1205	QQL071J-6R8Y	COIL	6.8uH J	
L1206	QQL071J-6R8Y	COIL	6.8uH J	
L1207	QQL29BJ-221Z	P COIL	220uH J	
L1208	QQL071J-150Y	COIL	15uH J	
BK1	LP40425-001A	BRACKET(PWB)		
CN1201	QGG2502K1-12	CONNECTOR	(1-12)	
LC1201	QQL29BJ-101Z	P COIL	100uH J	
SD1	LP31098-001B	SHIELD CASE(DEG)		
W1251	NRSA02J-0R0X	MG RESISTOR	0Ω 1/10W J	

MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

A/C head board

Block No. [1][2]

⚠ Symbol No.	Part No.	Part Name	Description	Local
PW1	LPA10158-01A1	A/C HEAD BOARD ASSY		

ADV. jog board

Block No. [3][9]

⚠ Symbol No.	Part No.	Part Name	Description	Local
PW1	LPA10241-01B2	ADV.JOG BOARD ASSY		
R7047	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	
CN7003	QGF1209F1-04	CONNECTOR	FFC/FPC (1-4)	
S7030	QSW0456-002Z	TACT SWITCH	24H EXPRESS	
UN7001	QSW0938-001	ROTARY ENCODER		

Loading motor board

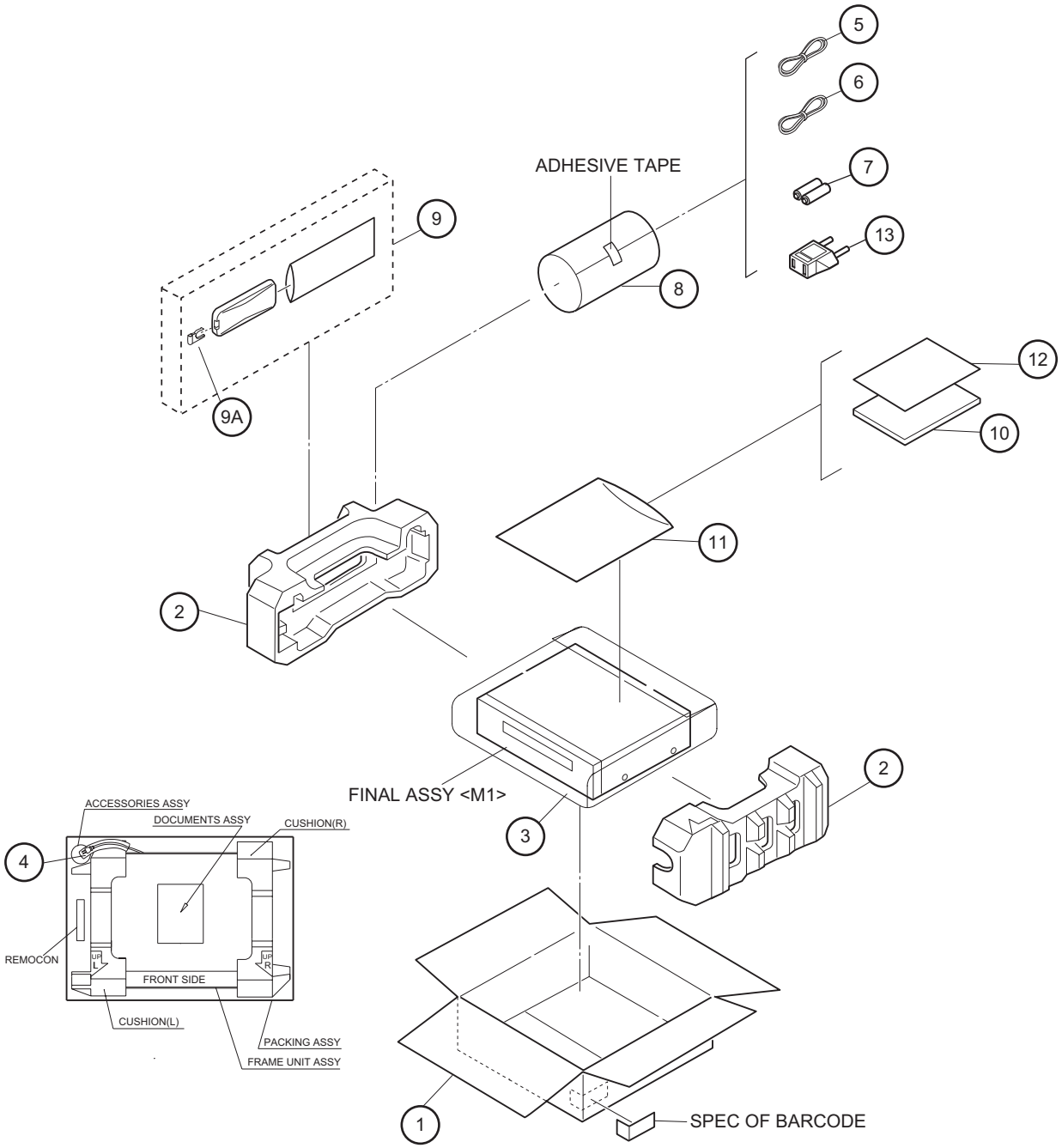
Block No. [5][5]

⚠ Symbol No.	Part No.	Part Name	Description	Local
PW1	LPA10158-01A2	LOADING MOTOR BOARD ASSY		

Packing materials and accessories parts list

The instruction manual to be provided with this product will differ according to the destination.

Block No. M3MM



MODEL	MARK	MODEL	MARK
HR-S6970AA	A	HR-S6970AH	C
HR-S6970AG	B	HR-S6970AJ	D

Packing and accessories

Block No. [M][3][M][M]

⚠ Symbol No.	Part No.	Part Name	Description	Local	
1	LP31421-006A	PACKING CASE			
2	LP31423-001B	CUSHION ASSY			
3	LP41038-002A	POLY BAG			
4	LP41078-001A	POLY BAG			A,C
5	QAM0505-001	RF CABLE			
6	QAM0516-002	S CABLE			
7	----------	BATTERY		R6 TYPE(x2)	
8	QPC02202230P	POLY BAG		22cm x 22cm	
9	LP20878-018B	REMOCON			
9A	LP40610-003A	COVER(BATTERY)			
⚠ 10	LPT0959-001A	INST.BOOK		(ENGLISH)	A
⚠ 10	LPT0958-002A	INST.BOOK		(CHINESE)	B
⚠ 10	LPT0958-003A	INST.BOOK		(ARABIC)	B
⚠ 10	LPT0985-001A	INST.BOOK		(ENGLISH)	C
⚠ 10	LPT0985-002A	INST.BOOK		(CHINESE)	C
⚠ 10	LPT0958-001A	INST.BOOK		(ENGLISH)	B,D
11	QPC02503530P	POLY BAG		25cm x 35cm	
12	----------	WARRANTY CARD		BT-56012-1	A
⚠ 13	QAM0027-002	CONVERSION PLUG			D